

# RECORD OF DECISION

RSR CORPORATION SUPERFUND SITE

OPERABLE UNIT NO. 3

HANDHELS and SHAC PILES

DALLAS, TEXAS

Prepared by

U.S. Environmental Protection Agency

U.S. Environmental Protection Agency

U.S. Environmental Protection Agency

RECORD OF DECISION  
CONCURRENCE DOCUMENTATION

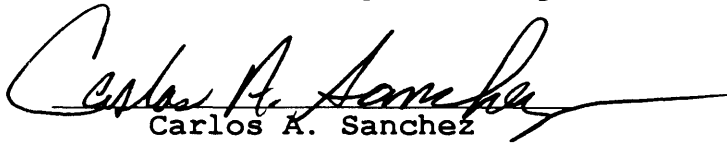
FOR THE

RSR CORPORATION SUPERFUND SITE  
OPERABLE UNIT NO. 3  
LANDFILLS and SLAG PILES



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Site Remedial Project Manager



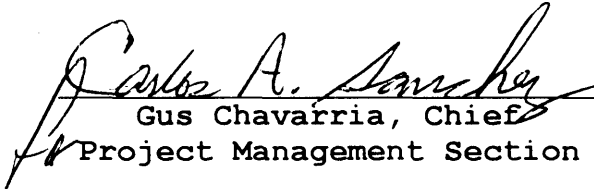
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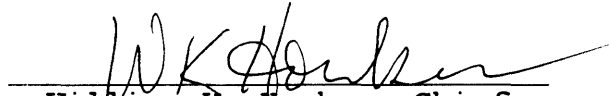
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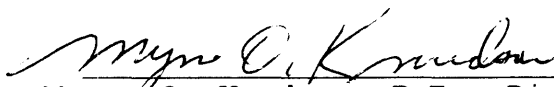
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**DECLARATION FOR THE RECORD OF DECISION  
RSR CORPORATION SUPERFUND SITE  
OPERABLE UNIT NO. 3  
LANDFILLS and SLAG PILES**

Statutory Preference for Treatment as a Principal Element  
is Not Met and Five-Year Review is Required

SITE NAME AND LOCATION

RSR Corporation Superfund Site, Operable Unit (OU) No. 3  
Dallas, Dallas County, Texas

STATEMENT OF BASIS AND PURPOSE

The United States Environmental Protection Agency (EPA) presents its decision in this Record of Decision (ROD) for Operable Unit (OU) No. 3, the location of the landfills and slag piles of the RSR Corporation Superfund Site (RSR Site). EPA's decision is in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund), 42 U.S.C. § 9601 et seq., and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300. The decision is based on materials and documents EPA relied on or considered that are contained in the Administrative Record for OU No. 3. Copies of the Administrative Record for OU No. 3 are available for public review at three repositories, one of which is located in the West Branch of the Dallas Public Library and within the RSR site and near OU No. 3. EPA bases this decision on the results of a Remedial Investigation, Feasibility Study, and Human Health Risk Assessment conducted at OU No 3.

The State of Texas, through the Texas Natural Resource Conservation Commission (TNRCC), concurs with EPA's selected remedy for OU No. 3 of the RSR Site.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances, as defined in Section 101(14) of CERCLA, 42 U.S.C. § 9601(14), and further defined in Section 302.4 of the NCP, 40 C.F.R. § 302.4, from the RSR Site, if not addressed by implementing the response action selected in this ROD, may present an imminent and

substantial endangerment to public health, welfare, or the environment.

#### DESCRIPTION OF THE REMEDY

Operable Unit No. 3 is part of the five (5) operable units of the RSR Site and consists of three (3) separate properties where slag, battery chips and/or other smelter waste have been disposed. Site 1 of OU No. 3, also known as the Westmoreland Road Property, encompasses approximately 50 acres of privately-owned property, and was used for surface dumping of slag, battery chips and other household and municipal debris. The area formerly designated as Site 2 was a disposal area physically located within the OU No. 5 property and was included as part of the OU No. 5 investigation and remedy and is not addressed as part of this ROD. Site 3 of OU No. 3, also known as the Walton Walker Property, encompasses approximately 130 acres of privately-owned property, where three (3) separate municipal landfills were operated by the City of Dallas from the mid-1960s through the later 1970s and early 1980s. Presently on Site 3, slag, battery casings and battery chips are present over much of the ground surface of the landfill properties. Site 4 of OU No. 3, also known as the Claiborne Boulevard Property, encompasses approximately 60 acres of privately-owned land, where four (4) separate municipal landfills were operated. Records indicate the City of Dallas leased this land during the 1950s and 1960s over various time periods until the mid-1970s. There is evidence of uncontrolled surface dumping of municipal type debris, along with slag and battery chips on the ground surface. The selected remedy will address contamination at Sites 1, 3 and 4 of OU No. 3 of the RSR Corporation Superfund Site.

The major components of the selected remedy include:

##### **Site 1:**

- Excavation and removal of slag, battery chips, metals contaminated soils and sediments exceeding cleanup goals (up to two feet);
- Off-site disposal of excavated material in an appropriate landfill;
- No Action on the Ground Water Portion of Site 1 of OU No. 3

##### **Site 3:**

- Containment (protective cap) of portions of the landfill where there is exposed slag, battery chips, and metals-contaminated soil exceeding cleanup goals;

- No Action on the Ground Water Portion of Site 3 of OU No. 3.

#### **Site 4:**

- Containment (protective cap) of portions of the landfill where there is exposed slag, battery chips and metals-contaminated soil exceeding cleanup goals;
- Removal of surficial contamination in Jaycee Park and placement under the protective cap (nonhazardous) or off-site disposal (hazardous), where cleanup goals are exceeded;
- No Action on the Ground Water Portion of Site 4 of OU No. 3

Arsenic, antimony and lead, the primary contaminants of concern at Sites 1, 3 and 4 of OU No. 3, are hazardous substances, as defined in Section 101(14) of CERCLA, 42 U.S.C. § 9601(14), and further defined in Section 302.4 of the NCP, 40 C.F.R. § 302.4.

#### STATUTORY DETERMINATIONS

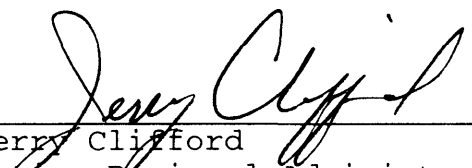
The selected remedy is protective of human health and the environment, complies with federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. This remedy utilizes permanent solutions and alternative treatment to the maximum extent practicable for this Operable Unit. However, due to the size of the landfills located on Sites 3 and 4 of OU No. 3, it was determined impracticable to excavate and treat the chemicals of concern effectively. Thus, the remedy for Sites 3 and 4 of OU No. 3 does not satisfy the statutory preference for treatment as a principal element of the remedy.

The future land use for Sites 3 and 4 may be limited to industrial use based on current zoning and/or reasonably anticipated future zoning for Sites 3 and 4. The current and reasonably anticipated future land use of Site 1 is residential. The remedy achieves cleanup levels that allow most, if not all, of the OU No. 3 sites to be available for the reasonably anticipated future use of industrial land use (Sites 3 and 4) or residential use (Site 1).

Because this remedy will result in hazardous substances remaining on-site above health-based levels five-year reviews will be necessary at Sites 3 and 4 of OU No. 3 of the RSR Site to ensure that the remedy continues to provide adequate protection of human health and the environment. Five year reviews will also be necessary at Site 1, because contamination may remain at depths greater than two (2) feet.

THE RECORD OF DECISION  
RSR CORPORATION SUPERFUND SITE  
OPERABLE UNIT NO. 3  
LANDFILLS and SLAG PILES

SIGNATURE AND AGENCY ACCEPTANCE OF THE REMEDY

  
\_\_\_\_\_  
Jerry Clifford  
Acting Regional Administrator  
U.S. EPA - Region 6

9/30/97  
Date

**DECISION SUMMARY**  
**RSR CORPORATION SUPERFUND SITE**  
**OPERABLE UNIT NO. 3**  
**LANDFILLS and SLAG PILES**

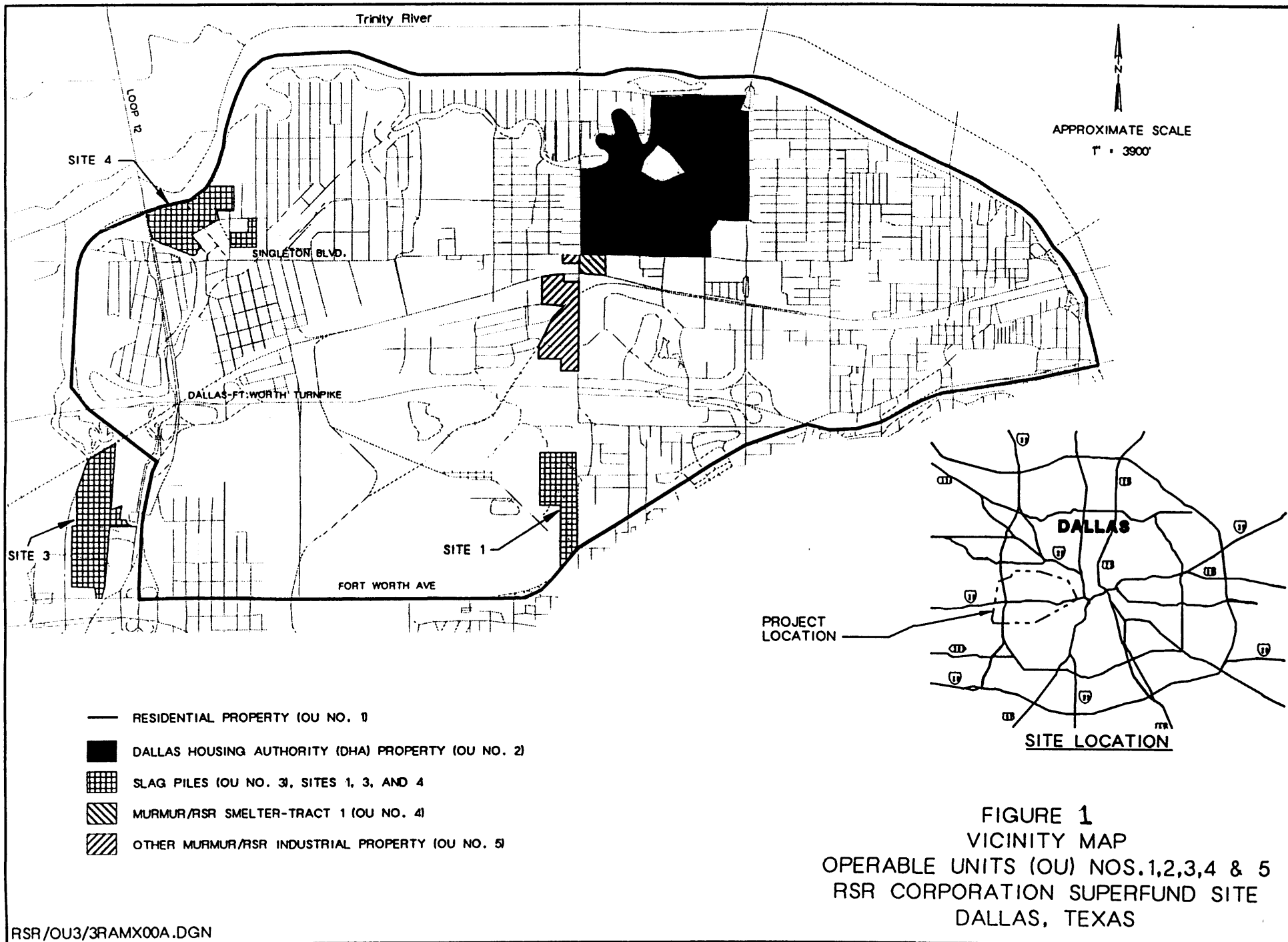
**I. SITE NAME, LOCATION, AND DESCRIPTION**

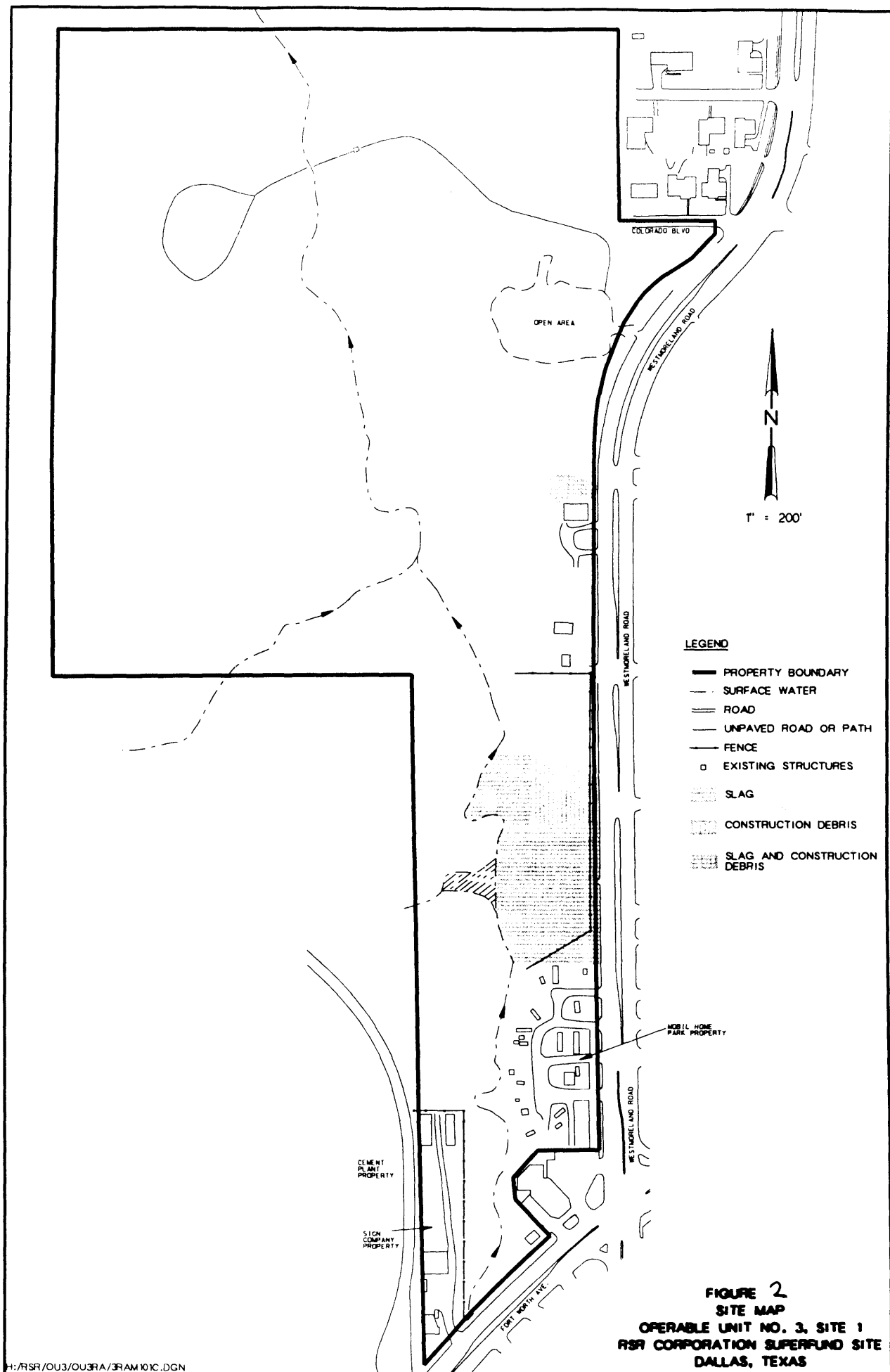
The United States Environmental Protection Agency (EPA) is addressing the release or threat of release of hazardous substances at the landfills and slag piles, Operable Unit (OU) No. 3 of the RSR Corporation Superfund Site (RSR Site) under the authority provided in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. § 9601 et seq. (also known as Superfund) and consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300. The RSR Site is located in west Dallas, Texas and encompasses an area approximately 13.6 square miles in size. The RSR Site is very diverse and includes large single and multi-family residential neighborhoods, multi-family public housing areas and some industrial, commercial and retail establishments. The population in this area is approximately 17,000. See **Figure 1.**

For approximately 50 years, a secondary lead smelting facility, located at the southeast corner of the intersection of Westmoreland Road and Singleton Boulevard, processed used batteries and other lead-bearing materials into pure lead, lead alloys, and other lead products. This smelter property, known as OU No. 4, is approximately 6.5 acres in size and contains several inactive structures. Other industrial property related to the smelter, the former battery wrecking facility, referred to as OU No. 5, is located on the southwest corner of the Westmoreland Road and Singleton Boulevard intersection. The smelter operations ceased in 1984.

OU No. 3 of the RSR Site consists of three separate areas (Sites 1, 3 and 4), which include two (2) former municipal landfills (Sites 3 and 4), and one (1) other disposal area (Site 1) where slag and battery chips generated from the smelting and battery breaking process were disposed.

Site 1 of OU No. 3, also known as the Westmoreland Road Property, is located on the west side of the 1000 block of Westmoreland Road, just north of Fort Worth Avenue in the south-central portion of the RSR site (**See Figure 2**). Based on the information compiled by EPA, Site 1 encompasses approximately 50 acres and is

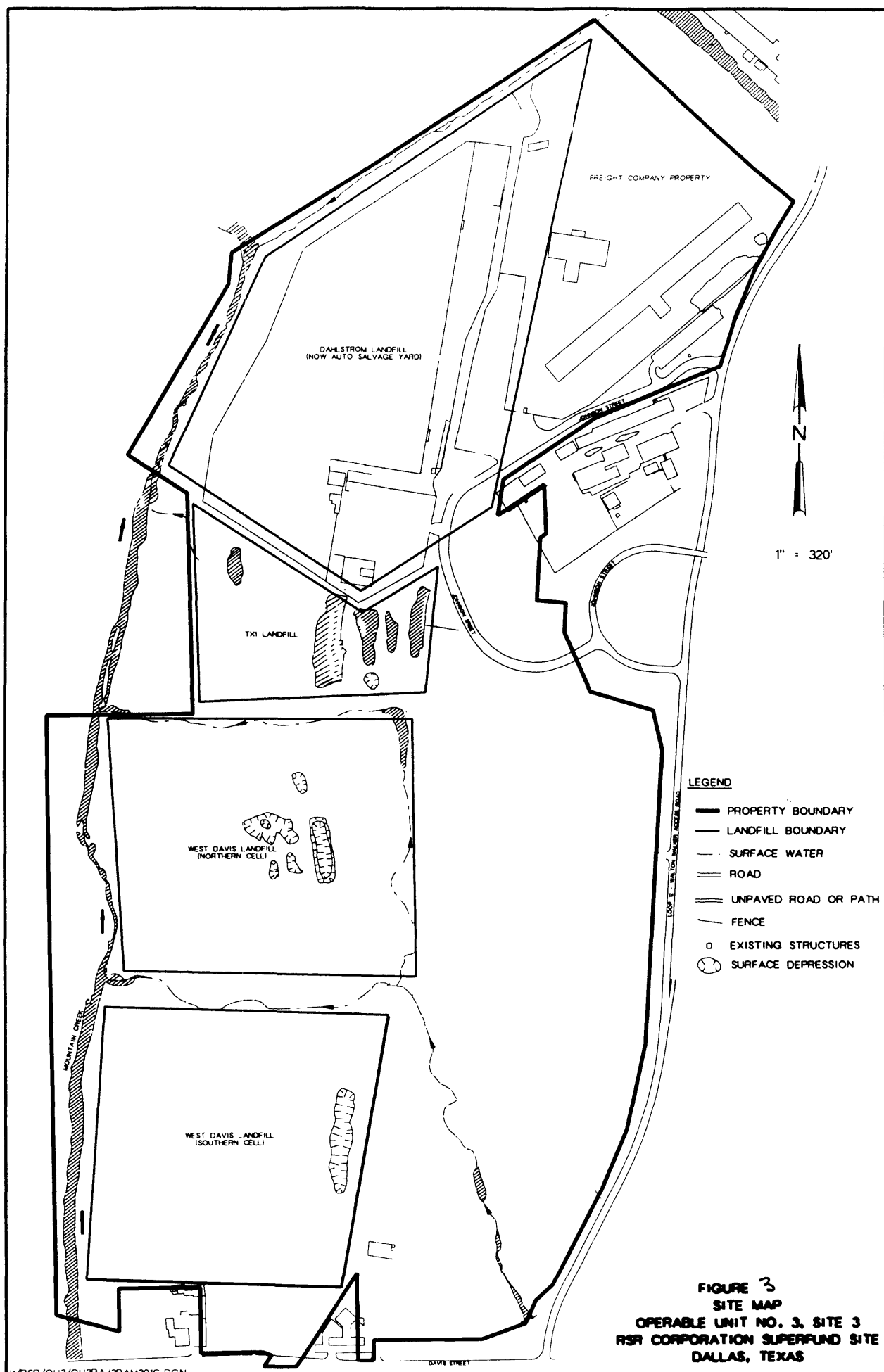




comprised of five (5) privately-owned properties. Portions of the eastern side of Site 1 have been used for surface dumping of slag, battery chips, and other material (i.e. used tires, appliances, and municipal debris). The area where most of the slag piles are located is partially enclosed by a chain link fence.

Site 3 of OU No. 3 is also known as the Walton Walker Property and is located northwest of Loop 12-(Walton Walker Boulevard) Davis Street intersection, in the far-western portion of the RSR Site (**See Figure 3**). Site 3 encompasses approximately 130 acres of privately owned property. Historical aerial photographs of Site 3 indicate that the area was apparently within the floodplain of Mountain Creek prior to the creek's diversion to its present location. The property owners leased the land comprising Site 3 to the City of Dallas, which operated three (3) sanitary landfills at this location from the mid-1960s through the late 1970s and early 1980s. The Dahlstrom Landfill is a 33.3-acre tract of land at the northern end of Site 3 that was in operation from 1976 to 1982. This property is now the site of an auto salvage yard. South of the Dahlstrom Landfill is the 23.6-acre TXI Landfill, which was in operation from 1973 to 1976. The 42.4-acre West Davis Landfill comprises the southern half of Site 3 and was in operation from 1964 to 1973. Since the TXI and West Davis landfills have closed, they have not been developed for other uses.

Site 4 of OU No. 3, also known as the Claibourne Boulevard Property, is located at the northern terminus of Claibourne Boulevard and in the northwest corner of the RSR Site (**See Figure 4**). Encompassing approximately 60 acres, Site 4 is bounded on the west and southwest by the Old Channel of the West Fork of the Trinity River. Site 4 also includes a nearby property, Jaycee-Zaragoza Park (Jaycee Park). Historical aerial photographs indicate that prior to construction of the Trinity River Levee, what is now known as Site 4 appears to have been within the floodplain of the Trinity River. Most of the area that is now Site 4 appeared to be used for sand and gravel mining through approximately 1956. The City of Dallas leased this land during the 1950s and operated four (4) sanitary landfills until the early to mid-1970s. Landfilling operations apparently were conducted on this property at various intervals between 1956 and 1970. The 3.2-acre Nomas Landfill, located at the northern end of Claibourne Boulevard was in operation from 1967 to the mid-1970s. The West Dallas Landfill is a 28.4-acre tract comprising the western half of Site 4. Operation of this landfill began some time after 1956 and ceased in 1975. In the late 1950s, the Dallas Park Board purchased the property that is now Jaycee Park





and received approval from the City to landfill the area to bring it to grade. Historical photographs indicate that by 1964, a park, baseball field, and recreation center were built at this location (Jaycee Park).

After landfilling activities were completed and the larger portion of land comprising Site 4 was released back to the property owner, it was subdivided. Some of the Nomas lots were sold, but the area was never developed. Surface dumping (mostly municipal debris) was evident on the eastern part of Site 4, and slag and battery chips were observed on the ground surface of the Nomas and West Dallas Landfills.

## **II. SITE HISTORY AND ENFORCEMENT ACTIVITIES**

OU No. 4 is the location at the RSR Site where secondary lead smelting operations were conducted from the early 1930s until 1984. The basic inputs into the smelting process were lead scrap and lead from used car batteries. In the first step of the smelting process the batteries were disassembled at the battery wrecking facility (OU No. 5) using hammer-mills to break the batteries into small pieces (e.g. battery chips). The lead posts and grids were then sent across the street to the smelter facility (OU No. 4) to produce soft pure lead or specialty alloys. In the refining process alloy elements, such as antimony, arsenic, and cadmium, were added as necessary to produce the desired product. Slag was generated as part of smelting process and is made up of oxidized impurities and molten lead. Slag that was not reprocessed in the smelter furnace and battery chips that were not also reprocessed, were both considered waste material and required disposal.

An extensive review of available historical information concerning the smelter's operation indicates that from approximately 1934 until 1971 the lead smelting facility and associated battery wrecking operations were operated by Murph Metals, Inc. or its predecessors. In 1971, RSR Corporation acquired the lead smelting operation and operated under the name Murph Metals. RSR continued to operate the smelter and associated battery wrecking operations until the acquisition of the facility by Murmur Corporation (Murmur). In 1984, the City of Dallas declined to renew the smelter's operating permit. The smelter and associated battery wrecking facility have not been operated since 1984.

During 1984 and 1985, TNRCC (formerly the Texas Water Commission) conducted inspections on the smelter and battery wrecking

facilities and identified several violations that involved the treatment, storage or disposal of hazardous wastes. In 1986, TNRCC approved a closure plan to be implemented by Murmur for portions of the battery wrecking facility located at OU No. 5. However, Murmur was unable to obtain certification by TNRCC of final closure, due to a dispute between Murmur and its contractor. In June of 1991 the State of Texas referred the case regarding the closure to the Superfund program for assessment. Immediately following this referral, TNRCC began receiving complaints from residents alleging that slag and battery chips had been disposed of on their properties.

In 1991, EPA began soil sampling in west Dallas to determine the presence of soil lead contamination. The results indicated that contamination existed in some residential areas near the smelter (OU No. 1) where fallout of contamination from the smelter stack had occurred and where battery chips or slag had been used as fill in residential yards and driveways. Consequently, EPA initiated an emergency removal action in the residential areas consisting of removal and off-site disposal of contaminated soil and debris in excess of removal action cleanup levels. This removal action in the residential area (OU No. 1) was completed in June of 1994.

In 1993, EPA initiated remedial investigations of the smelter and related properties (OU Nos. 4 and 5) and alleged smelter waste disposal areas (OU No. 3). In addition, an investigation of and removal action at OU No. 2, the public housing residential area, was initiated by the Dallas Housing Authority under EPA oversight pursuant to a CERCLA Administrative Order on Consent.

On May 10, 1993, EPA proposed the RSR Site to the National Priorities List (NPL) of Superfund sites (58 Fed. Reg. 27,507).

On September 29, 1995, the RSR Corporation Superfund Site was finalized on the NPL (60 Fed. Reg. 50435).

EPA notified several potentially responsible parties (PRPs) and provided them the opportunity to perform or finance the RI/FS for OU No. 3. The PRPs did not agree to perform or finance these response actions. EPA performed the RI/FS for OU No. 3 with funding from the Hazardous Substance Superfund (Fund).

### **III. HIGHLIGHTS OF COMMUNITY PARTICIPATION**

EPA has performed public participation activities for OU No. 3 as required in CERCLA Section 113(k), 42 U.S.C. § 9613(k), and

Section 117, 42 U.S.C. § 9617. The Remedial Investigation Report, Feasibility Study, and the Baseline Human Health Risk Assessment Report and the Proposed Plan for OU No. 3 of the RSR Site were released to the public on July 3, 1997. On or before July 3, 1997, EPA made available to the public these documents as well as other documents and information EPA relied on or considered in selecting the preferred alternative for Site 1, Alternative 2 - Removal and Monitoring, for Site 3, Alternative 3 - Protective Cap and Monitoring and for Site 4, Alternative 3 - Protective Cap, Removal and Monitoring. These documents were contained in an Administrative Record File for OU No. 3 (or draft Administrative Record) available for review at 3 locations; the West Dallas Public Library located at the RSR Site, the EPA Region 6 library in Dallas, and the TNRCC library in Austin, Texas. The notice of the availability of the Proposed Plan and the Administrative Record File was published in The Dallas Morning News on July 3, 1997. The public comment period commenced on July 3, 1997 and ended on August 4, 1997. EPA conducted a public meeting on July 24, 1997 to receive public comments from the community. EPA's responses to all comments received during the public comment period are included in the Responsiveness Summary, which is included as **Appendix A.** to this Record of Decision (ROD).

This ROD presents EPA's selected remedial alternatives for Sites 1, 3 and 4 of OU No. 3 of the RSR Site, located in Dallas, Texas. The selected remedy will provide protection of human health and the environment in accordance with CERCLA and consistent with the NCP. This decision is based on the Administrative Record for OU No. 3.

#### **IV. SCOPE AND ROLE OF OPERABLE UNITS**

There are five OUs of the RSR site, which are distinct geographical areas that are illustrated in **Figure 1** and described below:

OU No. 1 - Private residential areas potentially impacted by historical operations of the smelter;

OU No. 2 - The Dallas Housing Authority's public housing development located northeast of the smelter facility;

OU No. 3 - Former landfills and slag piles located at three different sites within west Dallas;

OU No. 4 - The smelter facility;

OU No. 5 - Former battery wrecking facility and other industrial tracts of land associated with the smelter and located across Westmoreland Road from the smelter facility.

This ROD addresses only OU No. 3 of the RSR Corporation Superfund Site. OU No. 3 is comprised of the three separate properties (Sites 1, 3 and 4) where slag, battery chips and/or other smelter waste have been disposed. Site 1 encompasses approximately 50 acres of privately-owned property, which was used for surface dumping of slag, battery chips and other household and municipal debris. Site 3 encompasses approximately 130 acres of privately-owned property, where three separate municipal landfills were operated by the City of Dallas from the mid-1960s through the later 1970s and early 1980s. Slag, battery casings and battery chips are present over much of the ground surface of the landfill properties. Site 4 encompasses approximately 60 acres of privately-owned land. Records indicate the City of Dallas leased this land during the 1950s and 1960s and operated four separate municipal landfills over various time periods until the mid-1970s. There is evidence of uncontrolled surface dumping of municipal type debris, along with slag and battery chips on the ground surface.

Final Records of Decision for OU Nos. 1 and 2 were issued on May 9, 1995. A final Record of Decision for OU No. 4 (except for the ground water component) was issued on February 28, 1996. A final Record of Decision for OU No. 5 and the ground water portion of OU No. 4 was signed on April 3, 1997.

This ROD for OU No. 3 is EPA's final decision to address the contamination associated with the three (3) separate sites that comprise OU No. 3. Potential ingestion, dermal contact and inhalation of materials present on OU No. 3 of the RSR Site contaminated with lead, arsenic, and antimony in excess of remedial action goals (described fully in Section VII.) pose unacceptable risks to human health and the environment. The purpose of the selected response action is to prevent current or future exposure to the contaminated materials present on Sites 1, 3 and 4 of OU No. 3 of the RSR Site.

## **V. SITE CHARACTERISTICS**

This section presents an overview of the characteristics of OU No. 3 of the RSR Site, the slag piles/landfills (also referred to herein as the "Sites 1, 3 or 4"). In the discussion of the Remedial Investigation findings, Sites 1, 3 and 4 will be discussed individually.

This Section contains a summary of the soils, geology, hydrogeology, ground water, topography, surface water, climate and land use for each of the Sites, followed by a detailed description of all of the pertinent features of Sites 1, 3 and 4. Finally, a discussion of the findings of the field investigation is included in the Nature and Extent of Contamination Section. Note that all of this information can be found in greater detail in the Remedial Investigation Report and supporting Technical Memorandums, which are all part of the Administrative Record for Operable Unit No. 3.

#### A. Soils

The soil survey of Dallas County, Texas, issued February 1980 by the USDA Soil Conservation Service (SCS), was used to identify the major soil types on the three sites comprising OU No. 3. The area specific complexes that were identified for each of the sites are discussed below.

##### 1. *Site 1 Soils*

Four soil types are found on Site 1. The *Eddy-Urban land complex*, found at the southern end of Site 1 is comprised of well-drained soils (clay loam overlying weathered limestone inter-laminated with clay loam), typically formed at depths up to 12 inches on gently sloping limestone surface and areas of urban land.

The *Eddy-Brackett complex* is found on both steep sides of the creek that flows north through the site, near its origin and is well-drained soil (clay loam, increasing in gravel content) typically formed at depths up to 20 inches on strongly sloping to moderately steep limestone slopes, and usually has a dense cover of trees, shrubs, grasses, and woody plants.

The *Ferris-Heiden complex* is comprised of deep (up to 78 inches) well-drained soils typically formed on gently rolling to rolling hillsides, and is found farther downstream on the creek through Site 1. The Ferris soil is formed on the steeper slopes, whereas the Heiden soil (dark clay grading to a mottled shale clay) is formed in valleys and on lower slopes and ridge tops.

The *Trinity Clay*, a deep (up to 68 inches) somewhat poorly drained soil (dark gray to grayish brown clay)

typically formed in nearly level, frequently flooded area, is found along the northern portion of Site 1.

With distance downstream in the drainage basin, soil permeability decreases from moderately slow (Eddy-Urban complex) to the very slow (Trinity Clay), whereas available water capacity increase from very low to very high. All soil types except the Trinity Clay are characterized by rapid runoff and severe erosion hazard potential.

## 2. Site 3 Soils

Two types of soil are found on Site 3. *Ovan clays*, found within the former Mountain Creek drainage basin and near the Dahlstrom Landfill property, are deep (up to 80 inches), moderately well drained clay soils (dark to very dark grayish brown to olive brown clay) formed in nearly level areas that are frequently flooded. The unit is characterized by very slow permeability, high available water capacity, slow runoff, and slight erosion hazard potential.

The *Arents loamy soils* formed in areas previously mined for sand and gravel (i.e., West Davis Landfill property), where discarded overburden and/or soil have been used to fill borrow pits. The resultant surface generally is lower than surrounding landscape, with 1 to 5 percent slopes and no uniform soil layers. These soils may be described as sandy clay loam, clay loam, loam, or fine sandy loam in the upper 80 inches of soil horizon; quartz pebbles are common, and organic matter content is low. They are characterized by moderate permeability.

## 3. Site 4 Soils

The entire Site 4 landfill area is characteristic of *Arents loamy soils*, which formed in areas previously mined for sand and gravel, where discarded overburden and/or soil has been used to fill borrow pits. The resultant land surface generally is lower than surrounding landscape, with 1 to 5 percent slopes and no uniform soil layers. These soils may be described as sandy clay loam, clay loam, loam or fine sandy loam in the upper 80 inches of soil horizon; quartz pebbles are common, and organic matter content is low. They are characterized by moderate permeability, and have medium potential for pasture and urban use.

## B. Regional Background Soil Concentrations

Literature sources were reviewed to find the expected background concentrations of selected inorganics in soil for comparison to concentration detected in the OU No. 3 soil and sediment samples. **Table 1** summarizes the typical regional or background concentrations. Also included in the table is the arithmetic mean, standard deviation, number of samples on which the data was based and a calculation of the arithmetic mean plus two standard deviations. It is the arithmetic mean plus two standard deviations (also called the Upper Tolerance Limit or UTL) compared with the inorganic concentrations exhibited by the soil and sediment samples.

## C. Regional Geology

Throughout Dallas County the geology and landscape are interrelated. The predominant geologic units are of the Upper Cretaceous Age. Near the RSR Site study area, the formations consist (in descending order) of the Austin Chalk Formation, the Eagle Ford Shale Formation, the Woodbine Formation, and the Grayson Marl and Main Street Limestone Formation. The geologic units that make up the Cretaceous system in north-central Texas form a southeastward-thickening wedge that extends into the East Texas Embayment. This sedimentary wedge ranges from zero thickness in the west to nearly 7500 feet in the southeast. Regional dip is to the east and southeast at 15 to 40 feet per mile but increases as much as 300 feet per mile on the flanks of the Preston anticline, in Grayson County, north of Dallas.

Geologic maps of the surface soils indicate the surface expression of the contact between the top of the Eagle Ford Shale Formation and the overlying Austin Chalk is present within the RSR Site study area. As documented by logs of deep wells in the area, the full thickness of the Eagle Ford Shale Formation, which overlies the Woodbine Formation, is present beneath all three OU No. 3 sites.

The Eagle Ford Shale Formation is composed primarily of dark shales with occasional thin stratas of sandstone, limestone, and bentonite. The Eagle Ford Shale Formation has two members, the Arcadia Park being the upper, and the Britton being the lower member. The Arcadia Park is described as a basal blue clay twenty (20) feet thick; overlain by one to three feet of thin

**Table 1**  
**Comparison of OU No. 3 Soil/Sediment Data to Regional**  
**Background Data**  
**RSR Corporation Superfund Site**  
**Operable Unit No. 3**

Chemical	Background Soil Concentrations (mg/kg)					Maximum - Observed OU No. 3 Concentrations (mg/kg)								
	Range	Arithmetic Mean	Standard Deviation	Number of Samples	Arithmetic Mean + 2 Standard Deviations	Site 1			Site 3			Site 4		
						Surface Soil	Sub-surface Soil	Sediment	Surface Soil	Sub-surface Soil	Sediment	Surface Soil	Sub-surface Soil	Sediment
Aluminum <sup>a</sup>	700 - > 100,000	72,000 47,000 <sup>a</sup>	-- 2.48	1,247	47,000	32,300	10,800	17,000	29,800	27,900	25,500	25,900	19,000	23,500
Arsenic	1.1 - 18	6.4	3.3	119	13	7,980	309	224	127	12.8	55.8	252	114	19.6
Barium	150 - 1,000	404	200	119	800	2,330	431	272	934	131	426	2,330	1,060	162
Beryllium	N.D. - 7.0	0.62	1.06	119	2.7	4.3	0.79	2.5	1.6	1.5	2.5	2.8	1.3	2.4
Cadmium <sup>b</sup>	N.D. - 11	--	--	1,319	--	637	17.7	43.1	8.4	1.3	9.1	8.7	15.1	0.75
Chromium	3.0 - 150	40	28	119	96	204	40.5	94.1	288	85	66.6	69.1	1,420	41.7
Cobalt	N.D. - 30	4.9	4.5	119	14	86.1	21.1	12.6	19.8	32.6	64.2	264	25.7	12.6
Copper	3.0 - 30	15	8.0	119	31	6,610	484	219	286	37.3	213	395	2,090	71.9
Lead	N.D. - 30	13	8.1	119	29	105,000	6,540	3,940	71,500	320	2,100	6,390	11,500	364
Manganese <sup>b</sup>	< 2.0 - 7,000	550 330 <sup>a</sup>	-- 2.77	1,317	340	3,490	3,050	7,630	1,060	680	2,380	970	1,200	1,200
Mercury	< 0.01 - 0.69	0.064	0.097	119	0.26	2	0.06	0.55	0.61	0.13	1.2	0.86	0.52	0.32
Nickel	N.D. - 50	12	8.8	119	30	1,180	95.1	49.4	162	12,200	62	62.6	95.8	33.2
Silver <sup>b</sup>	N.D. - 5.0	--	--	1,319	5.0 <sup>c</sup>	3.2	0.24	3.4	1.55	1.25	0.55	4.4	6.2	1.75
Thallium	--	--	--	--	---	4.4	1.1	7.95	0.9	2.9	1.25	2.6	5.4	2.55
Vanadium	7.0 - 200	52	37	119	130	64.7	50.2	56.3	72.8	64.7	58.8	52.1	43.7	54.3
Zinc	5.0 - 108	39	22	116	83	4,300	630	2,090	796	116	394	17,500	4,250	276

Source: Dragun, J. and Chiasson, Andrew. 1991. Elements in North American Soils. Hazardous Materials Control Resources Institute.

<sup>a</sup>Geometric mean

<sup>b</sup>Soil of conterminous USA, rather than Texas soils only

<sup>c</sup>Maximum value

limestone flags; overlain by an uppermost part of some seventy-five (75) feet of blue shale with calcareous concretions of various size, which is unconformable, overlain by the Austin Chalk. The underlying Britton member is typically 250-300 feet thick and consists mostly of blue clay/shale. The Eagle Ford Shale Formation is commonly referred to as an aquitard overlying the Woodbine Formation.

### *1. Site 1 Geology*

The shallow subsurface geology of Site 1 generally begins at the surface with an organic clay soil overlying the eroded Austin Chalk Formation. The Site 1 boring locations, the Austin Chalk is approximately 20 to 25 feet thick, and is characterized by weathered zones containing interbedded laminations of sand, clay, and organic matter. The Austin Chalk unconformably overlies the Eagle Ford Shale.

### *2. Site 3 Geology*

The shallow subsurface geology of Site 3 generally consists of silty clay, ranging in thickness from 15 to 25 feet, underlain by a gravelly clay between 1 and 6 feet thick. Underlying this unit is a silty clay which grades into a silty sand. This interval ranges in thickness from 10 to 35 feet. At borings advanced on the far west side of Site 3 (relatively close to Mountain Creek) a discontinuous, water-bearing sandy gravel approximately 0.5 to 1 foot thick was found to exist unconformably over the Eagle Ford Shale. At borings advanced on the east side of Site 3 there appeared to be less alluvial deposition, and the transmissive interval described above was either less defined or did not exist. Landfill debris was observed primarily in the shallow subsurface on the Site 3 landfill cells and the thickness of debris varied greatly (ranging from 3 to 39 feet).

### *3. Site 4 Geology*

At Site 4, the shallow subsurface generally begins at the surface with a sandy organic clay, approximately 1 to 3 feet thick. The underlying unit is a silty clay to clayey silt, approximately 10 to 25 feet thick, which grades to a silty sand, 1 to 6 feet. The silty sand overlies a water-bearing gravelly sand, which was encountered at thickness between 0.5 feet and 3 feet. The sand and gravel unconformably overlie the Eagle Ford

Shale, the top 0.5 to 3 feet of which was observed to be weathered.

#### D. Hydrogeology

In north-central Texas, the two most important water-bearing stratigraphic units are the Woodbine Group, a minor aquifer, and the Trinity Group, a major aquifer. A major aquifer is defined as one which yields large quantities of water in a comparatively large area of the State, and a minor aquifer is defined as one which yields large quantities of water in small areas, or relatively small quantities of water in large areas of the State. Both aquifers provide municipal, domestic, industrial, and some irrigation supplies to the north-central portion of the State. It should be noted that water for Dallas residents is provided by the City of Dallas water system, which draws its water from surface reservoirs many miles from the RSR Site.

The Woodbine Aquifer is of Upper Cretaceous age and is composed of sand and sandstone. The nearest outcrop of the Woodbine Formation in the vicinity of the OU No. 3 Sites is in far northwestern Dallas County and eastern Tarrant County. Groundwater flow within the Woodbine is generally to the east. In the vicinity of the RSR Site the depth to the Woodbine from the ground surface is approximately 200 to 250 feet.

The Trinity Group Aquifer is comprised of Lower Cretaceous age formations (the Paluxy, Glen Rose, Twin Mountains, and Antlers) which are older and encountered at greater depths than the Woodbine and other geologic units present within OU Nos. 4 and 5. These geologic units were deposited in fluvial, deltaic, and shallow marine depositional environments, and are typically comprised of sands interbedded with clays, limestone, dolomite, gravel, conglomerates, and evaporates (the latter are present in the upper Glen Rose). Outcrops of Trinity Group formations are found in Parker County, approximately 60 miles west of Dallas County. Within the RSR Site, the depth to the Trinity Aquifer from the ground surface is approximately 1,300 to 1,500 feet to the Paluxy formation and approximately 2,500 feet to the Twin Mountains Formation.

The Quaternary alluvial deposits also contain small amounts of water in this area, although they are not classified as a minor or major aquifer by the State. The shallow groundwater in the vicinity of OU No. 3 is not generally considered a water supply aquifer due to its overall low yield and slightly saline quality. The monitoring wells installed as part of the OU No. 3 RI

generally were completed in the alluvial material overlying the Eagle Ford Shale, which is not believed to be hydraulically connected to the deeper Woodbine aquifer due to the presence of the Eagle Ford Shale at thickness of up to 300 feet beneath the site.

#### E. Groundwater Quality

In the Dallas area, the general quality of groundwater from the Trinity Aquifer ranges from 500 to 3,000 mg/l total dissolved solids (TDS), which indicates fresh to slightly saline water. Sulfate and chloride concentrations do not exceed secondary drinking water standards of 300 mg/l. Increasingly poor quality (high TDS) water from this aquifer in parts of the Dallas-Ft. Worth area in recent years has been attributed to over-pumpage of the aquifer.

Only the lower part of the Woodbine Aquifer (i.e., the upper sand unit at a depth of 730 to 830 feet) is considered to be suitable for development due to high iron concentrations in the rest of the aquifer. In the Dallas area, groundwater from various units of the Woodbine Aquifer is in the 1,000 to 3,000 mg/l range for TDS (slightly saline), and sulfate concentrations generally exceed TNRCC's recommended drinking water limit of 300 mg/l (30 TAC § 290.113). Wells completed on or near the outcrop tend to produce groundwater of a higher quality. The primary uses of water derived from the Woodbine are for domestic livestock and public supply. However, due to (1) an increasing dependence on surface water for public supplies, (2) historically large withdrawals of water from the Woodbine, and (3) low permeabilities of the Woodbine's water-bearing zones, this aquifer is no longer used as a primary source of drinking water for Dallas County, and is not used by the City of Dallas.

The primary source of recharge for both the Trinity and Woodbine Aquifers is considered to be precipitation on outcrop surfaces. Recharge from streams flowing across the outcrop, and surface-water seepage from lakes, streams, and ponds are considered secondary sources. No primary recharge areas are located within five miles of OU No. 3. As stated previously, the outcrop surfaces for the Woodbine and Trinity Formations are located a minimum distance of 10 miles to the west of the RSR study area.

The water contained in the Quaternary alluvial deposits is a result of surface infiltration from runoff and likely interacts directly with surface water features in the area.

## F. EPA Ground water Classification

Based on the *Guidance on Remedial Actions for Contaminated Ground water at Superfund Sites (EPA/540/G-88/003)*, EPA generally classifies ground water as Class I, Class II, or Class III. These classifications are considered guidelines for determining the appropriate amount of remediation for a Superfund site and are paraphrased below.

- **Class I** (special ground water) is:
  - (1) highly vulnerable to contamination based on hydrological characteristics; and
  - (2) either irreplaceable as a drinking water source or ecologically vital.
- **Class II** (current and potential sources of drinking water and water having other beneficial uses) is categorized as:
  - (1) Class IIA, ground water that is currently used; or
  - (2) Class IIB, ground water that is potentially available for drinking water, agriculture, or other beneficial use.
- **Class III** (ground water not considered a potential source of drinking water and of limited beneficial use) has the following characteristics:
  - total dissolved solids greater than 10,000 milligrams per liter (mg/l), or
  - is otherwise contaminated by naturally occurring constituents or human activity not associated with a particular waste disposal activity or another site beyond levels that allow remediation using methods reasonably employed in public water treatment systems.

Class III ground water is:

- (1) *Class IIIA*, ground water that is interconnected to surface water or adjacent ground water that potentially could be used for drinking water; or
- (2) *Class IIIB*, ground water that has no interconnection to surface water or adjacent aquifers.

## G. Topography

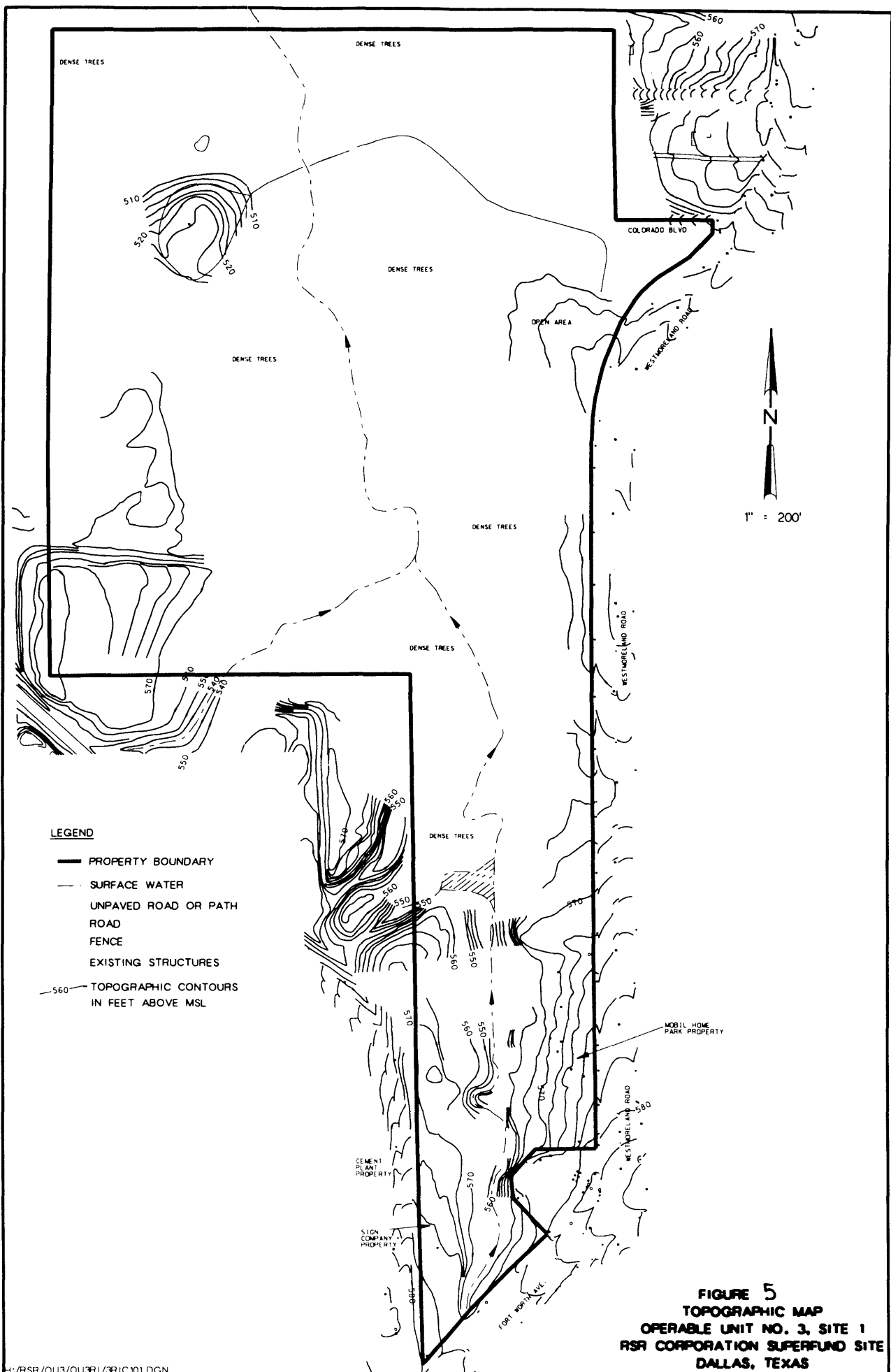
The RSR Site is located on the margin between two physiographic provinces; the Blackland Prairie to the east and the Eastern Cross Timbers to the west. The Blackland Prairie was formed on sediments of the Taylor Marl, the Austin Chalk, and the Eagle Ford Shale Formation; the physiographic province is characterized by poorly drained soil, and relatively flat to moderately undulating surfaces that slope to the east. The Eastern Cross Timbers physiographic province coincides with the Woodbine Formation outcrop (sandstone) and is characterized by low, rounded, wooded hills along its western margin and gentle slopes along its eastern margin. Most of the northeastern and northwestern portions of the RSR Site are located on a floodplain terrace of the Trinity River, and most of western portion is located within floodplain of Mountain Creek. The following paragraphs describe the topography of each of the three sites comprising OU No. 3.

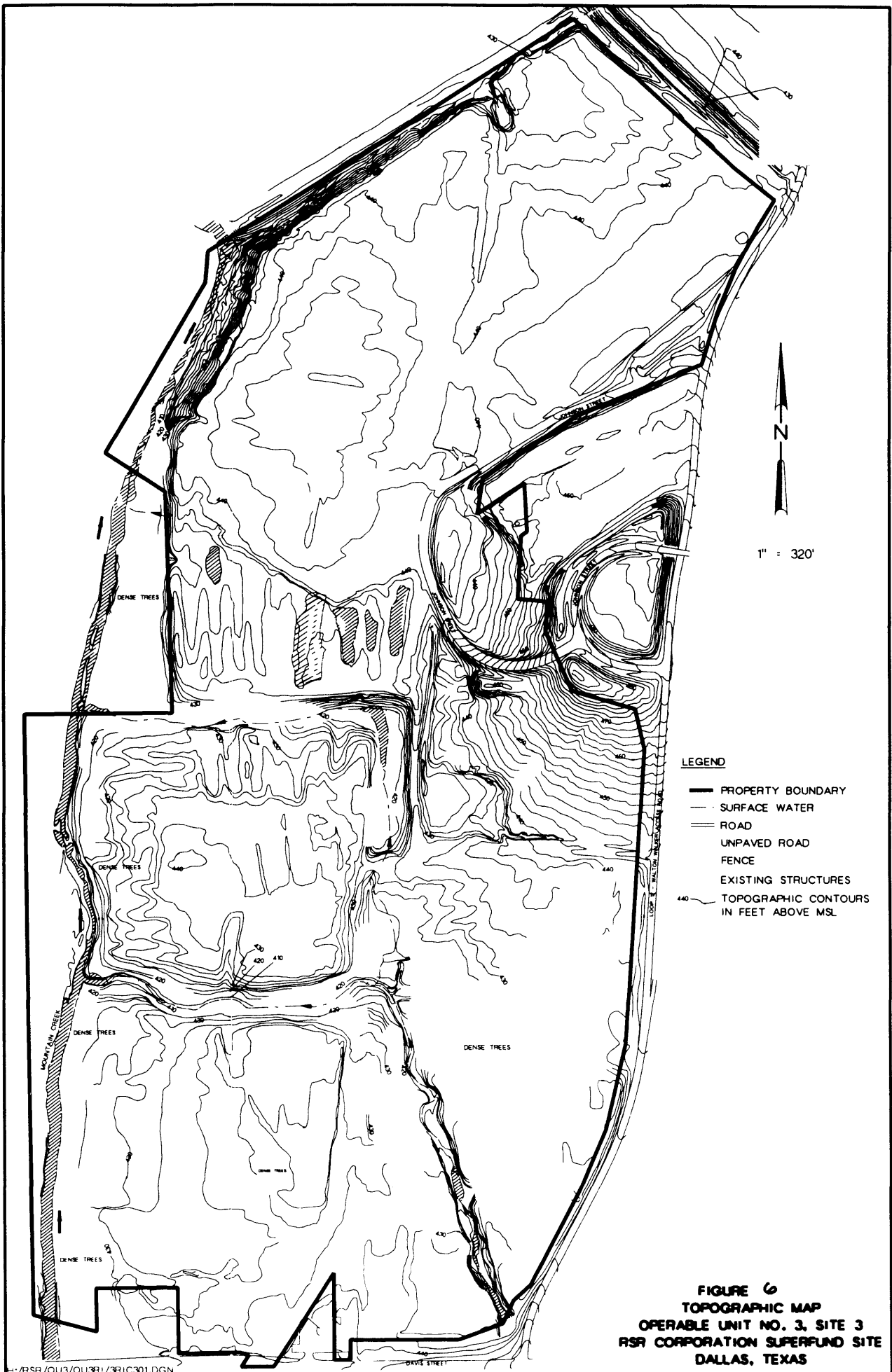
### 1. Site 1 Topography

The topography of Site 1 reflects the local geology. The site is situated near the top of the White Rock Escarpment, which is the most western outcrop of the relatively resistant Austin Chalk formation. The ground surface elevation of Site 1 decreases from an elevation of 580 feet above mean sea level (MSL) in the southern portion to 560 feet MSL in the northern part (**See Figure 5**).

### 2. Site 3 Topography

Historical aerial photographs indicate that the area that is now Site 3 was part of the Mountain Creek floodplain prior to the creek's diversion to its present location. The diversion appears to have been completed by the mid-1940s. The topography of the site was affected by the City of Dallas landfilling activities conducted from the 1960s through the 1980s (illustrated in **Figure 6**). The ground surface of the Dahlstrom Landfill is approximately 438 to 440 feet above MSL. The surfaces of the TXI and West Davis Landfills are slightly lower (approximately 430 to 438 feet above MSL) and characterized by moderate-gradient berms and trenches believed to be remnants of former landfilling activities. The TXI Landfill has some standing water in some of the trench areas. The ground surface along Mountain Creek is relatively flat (424 to





426 feet above MSL) and slopes steeply at the stream channel to approximately 410 above feet MSL.

### *3. Site 4 Topography*

Site 4 appears to be part of the Trinity River floodplain, and historical aerial photographs indicate that levee construction was in progress in 1938. The topography of Site 4 has been affected by the City of Dallas landfiling activities conducted in this area from the 1950s through the 1970s. The topographic features of Site 4 are shown in **Figure 7**. The West Dallas Landfill ground surface is between approximately 423 and 426 feet above MSL and relatively level, and drops sharply near each of the drainages. The elevations of the Nomias Landfill range from approximately 424 feet to 416 feet above MSL on the southern end of the landfill. Elevations range from 414 to 417 feet above MSL over the majority of the Vilbig Landfill. The surface of the Jaycee Park Landfill is virtually level (approximately 416 feet above MSL).

## *H. Surface Water*

The Trinity River and its tributaries are the only major surface water bodies in the vicinity of the OU No. 3 sites, as shown in **Figure 8**. There are smaller drainage systems flowing through or past these sites that eventually discharge to the Trinity River. The Texas Water Code specifies all segments of the Trinity River Basin for recreational use. None of the river segments are specified for domestic water supply.

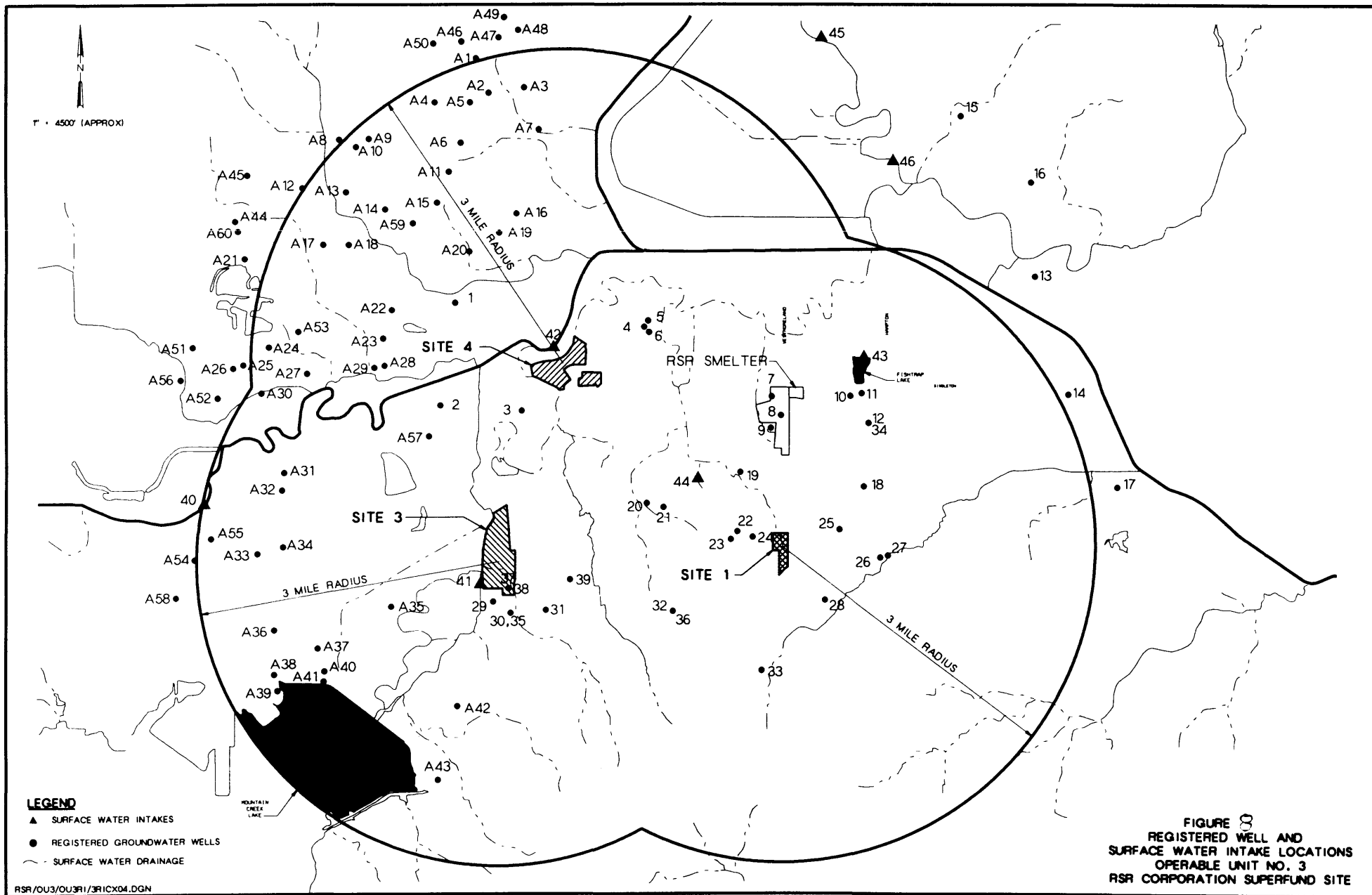
### *1. Site 1 Surface Water*

An ephemeral creek flows northern from a storm sewer outfall through Site 1 and discharges to series of drainage ditches along I-30 approximately 0.75 mile north of the site. These drainage ditches transmit water generally north and to the Trinity River at the Hampton Road pumping station.

### *2. Site 3 Surface Water*

In addition to areas of shallow standing water on the landfills within Site 3, other surface water bodies on this site include a series of ephemeral creeks recharged by a storm sewer outfall at the Loop 12-Davis Street





intersection. These creeks flow across the site and discharge to Mountain Creek, which flows north along the western boundary of Site 3 and discharges into the West Fork of the Trinity River.

### 3. *Site 4 Surface Water*

Site 4 is bounded by the Old Channel of the West Fork of the Trinity river and a drainage channel originating at a storm sewer outfall located at the corner of Iroquois and Gallagher Streets on the southwest/west and northeast sides. These channels flow generally north and discharge to a drainage channel located on the south side of the Trinity River Levee, which flows east along the north side of Site 4.

## I. Climate

The climate in Dallas County is temperate to hot. During the winter, cold surges of air cause the moderate temperature to drop, thereby producing cool winters with occasional snow. Rainfall throughout the County is relatively consistent throughout the year, with a slight increase usually in the spring. Wind direction is primarily from the south-southeast. In the DFW area, the average annual windspeed for 1992 was 9.9 miles per hour (mph).

## J. Land Use and Zoning

The distribution of land uses within the RSR Site is shown on the zoning map presented in **Figure 9**. The land use of the areas comprising the three OU No. 3 sites are discussed below.

### 1. *Site 1 Land Use*

The southwestern portion of Site 1 is presently zoned for light industrial use, which includes wholesale distribution and storage. The rest of the site is zoned for multi-family use.

### 2. *Site 3 Land Use*

The Dahlstrom and TXI Landfill properties located on Site 3 are zoned from agricultural use. The West Davis Landfill property is currently zoned for light industrial use.

Trinity River

N  
APPROXIMATE SCALE  
1" = 2500'

LOOP 12

SITE 4

WINGETON BLVD

SHILTON BLVD

LA RELAY

DALLAS-FT. WORTH TURNPIKE

FORT WORTH AVE

SITE 1

SITE 3

NOTES:  
SEE THE FOLLOWING PAGE FOR FIGURE LEGEND

**FIGURE 9**  
**LAND USE AND ZONING BOUNDARIES**  
**OPERABLE UNIT NO. 3**  
**RSR CORPORATION SUPERFUND SITE**  
**DALLAS, TEXAS**

### 3. *Site 4 Land Use*

There are four Landfills comprising Site 4 (Vilbig, Nomas, West Dallas, and Jaycee Park). The Vilbig and Nomas properties are zoned for mobile homes and the West Dallas and Jaycee Park properties are zoned for single-family residential dwellings. When the City of Dallas landfilling operations ceased in the early to mid-1970s, some of the property comprising the Vilbig, Nomas, and West Dallas Landfills was subdivided after being released to the property owners. These properties were never developed. EPA, in coordination with the TNRCC, is presently working with the City of Dallas to change the zoning for the landfills on Site 4 to non-residential use.

#### K. Nature and Extent of Contamination

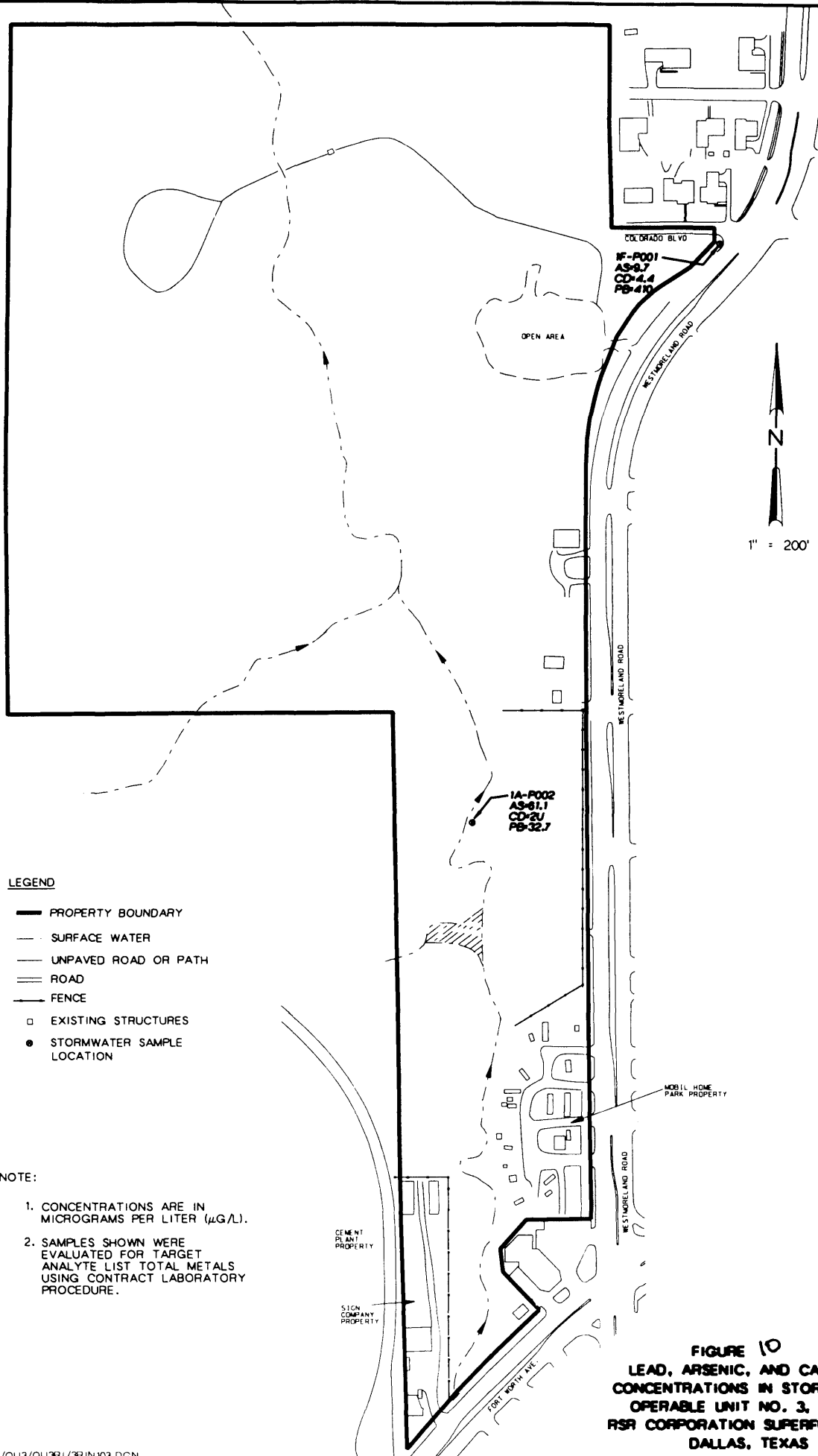
As part of the RI, all potential sources and areas of contamination were investigated at each of the OU No. 3 Sites. These areas included the storm sewers, the surface water and sediments, surface and subsurface soils, and the ground water. Samples were collected and analyzed from each of these areas to evaluate the nature and extent of contamination. Migration to the subsurface soils and the ground water was also investigated through exploratory borings, test pits and the installation of ground water monitoring wells. For purposes of discussion of the OU No. 3 RI, surface soil is defined as the top two (2) inches of soil, and subsurface soil is defined as the soil material below this two (2) inch horizon.

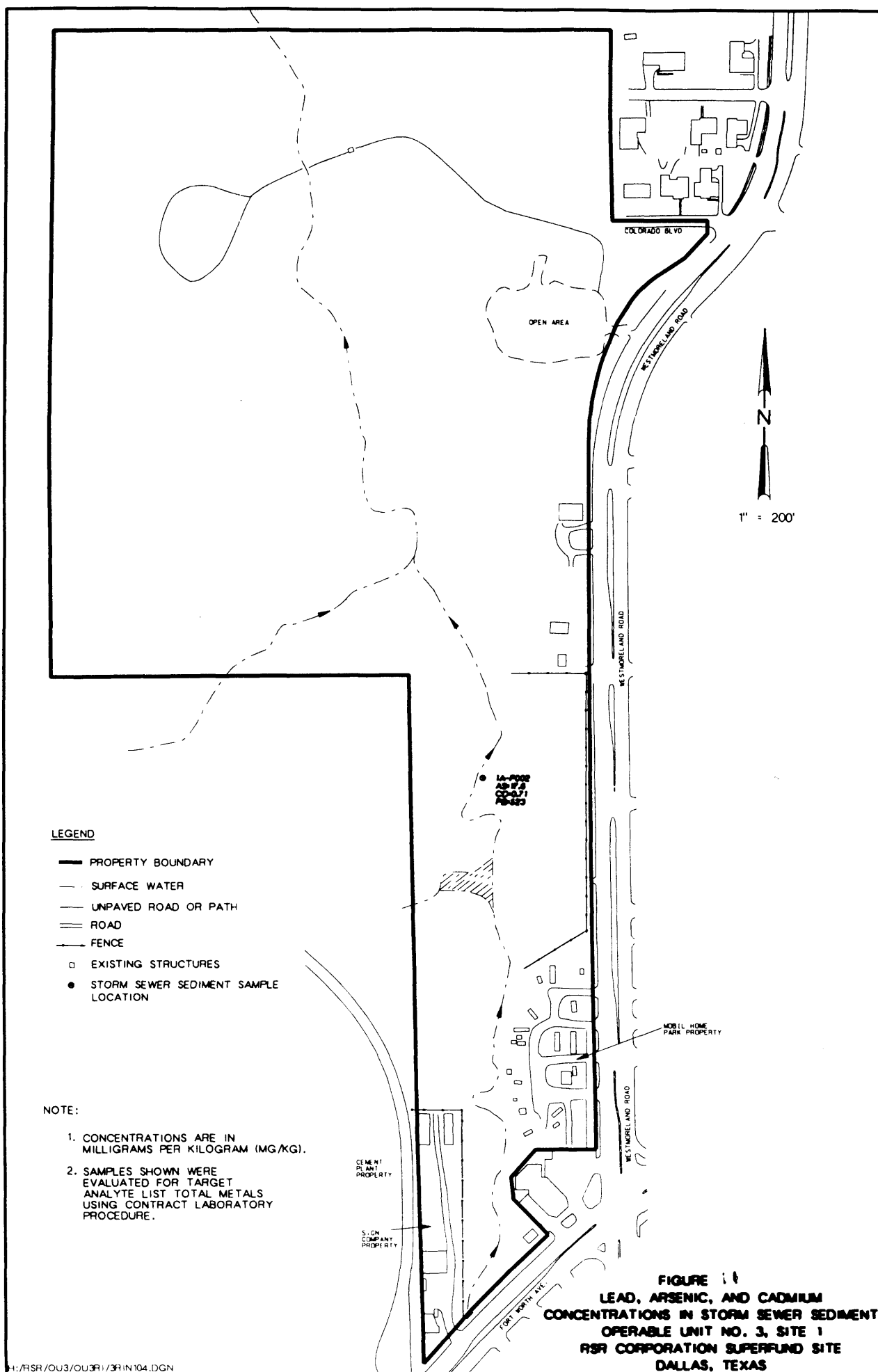
A summary of the findings of the RI is provided in the discussions below, however, as stated previously, all of this information can be found in detail in the Remedial Investigation Report and supporting Technical Memorandums, which are all part of the Administrative Record for OU No. 3. The RI findings for each of the three (3) OU No. 3 Sites are discussed individually.

#### **Site 1 - Nature and Extent of Contamination**

##### 1. *Site 1 Storm Sewers and Drainages*

Water samples were collected from two (2) locations on Site 1 and a sediment sample was collected from one (1) location. **Figures 10 & 11**, respectively, illustrate the locations of storm water and sediment samples, along with the concentrations of lead,





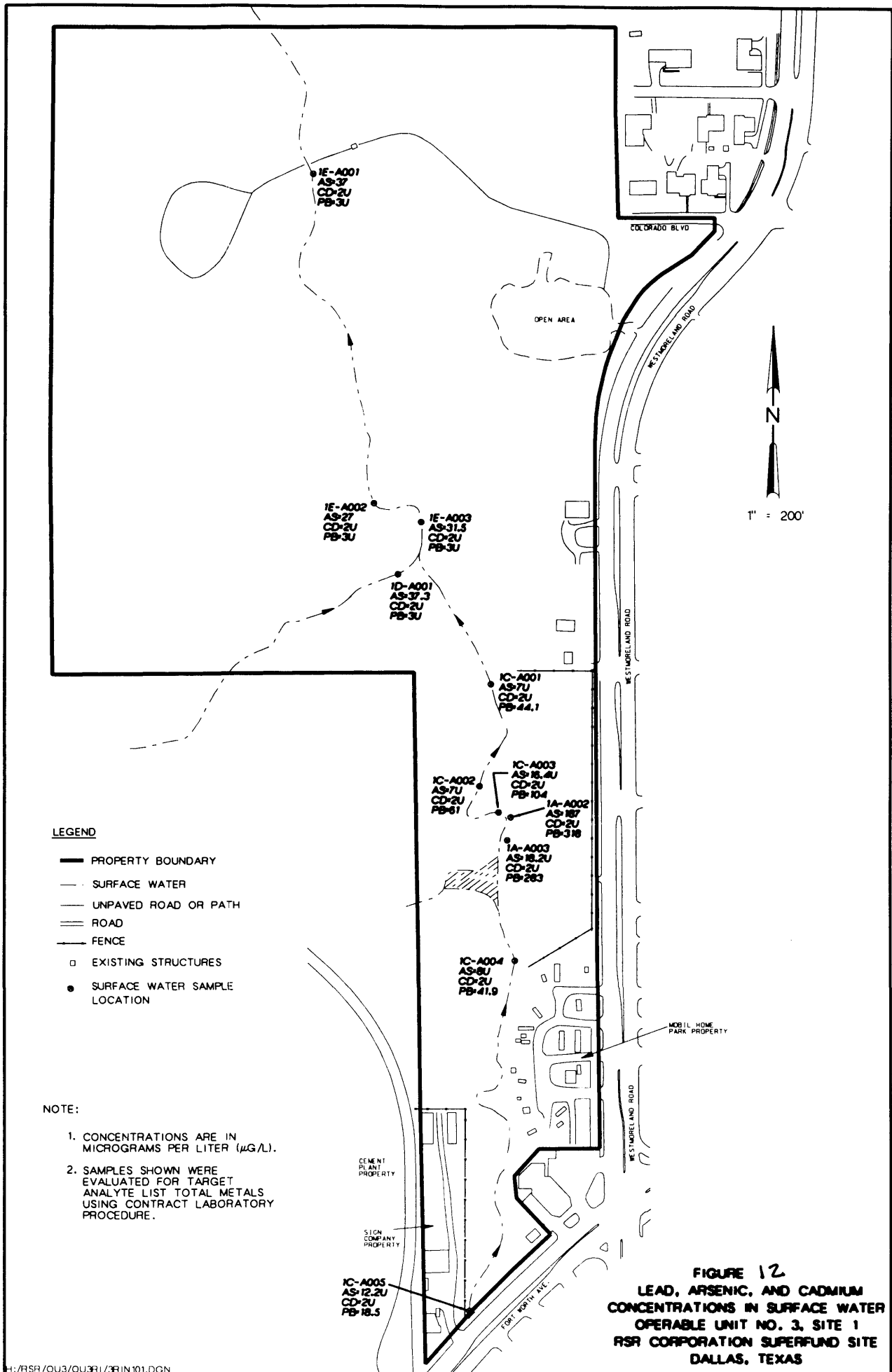
arsenic and cadmium. The highest lead concentrations, 410 micrograms per liter (ug/L) was detected in the Westmoreland Road inlet sample, whereas the sample from the onsite drainage channel demonstrated a lead concentration of 32.7 ug/L. The elevated lead concentration by the inlet sample may be as a result of runoff from the surfaces of Westmoreland Road and Colorado Boulevard. The highest concentration of the arsenic (61.1 ug/L) was detected in the sample from the onsite drainage, however cadmium was not detected in that sample. The concentration of lead, arsenic and cadmium detected in the onsite stormwater sediment sample was 523 milligrams per kilogram (mg/kg), 17.6 mg/kg and 7.1 mg/kg.

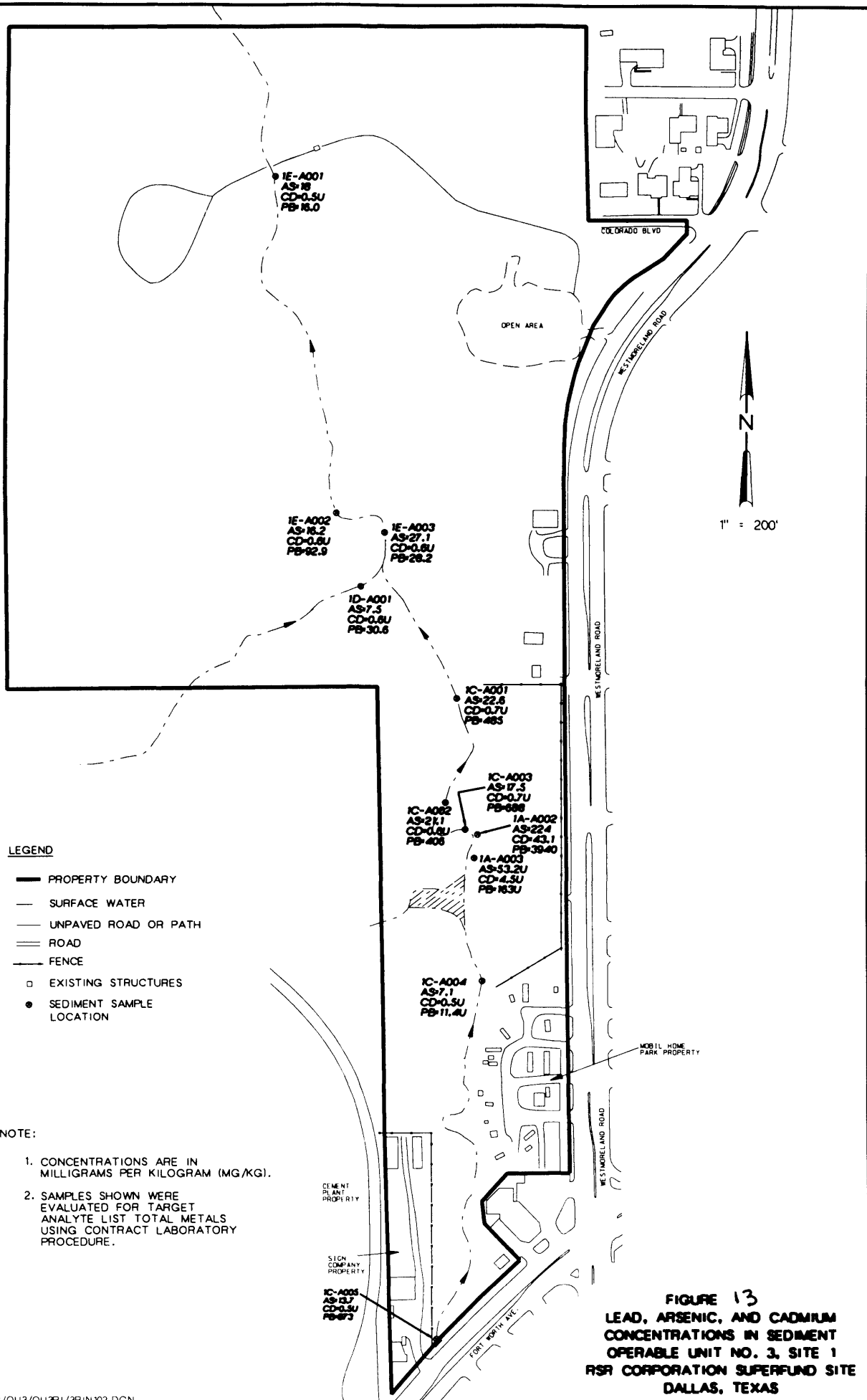
## *2. Site 1 Surface Water and Sediment Results*

Surface water samples were collected from Site 1 to determine the nature and extent of any surface water contamination. Eleven (11) sampling locations were selected on Site 1; seven (7) were located within the creek that flows north through the site, two (2) were located at the surface seeps along the eastern bank of the creek and one was located within the drainage channel that flows east from the cement plant. **Figures 12 & 13** illustrate the surface drainage flow direction and the concentrations of lead, arsenic and cadmium detected in the surface water and sediment samples, respectively. The range of lead concentrations detected in the surface water was from 18.5 ug/L (upgradient) to 318 ug/L (surface seep). Lead was not detected in drainage from the cement plant, or from samples downstream of the confluence of this drainage. Arsenic concentrations were only detected in five (5) of the eleven (11) samples and concentrations ranged from 27 ug/L to 187 ug/L. Sediment samples were also collected from these eleven (11) surface water locations. Lead was detected in nine (9) samples at concentrations ranging from 16 mg/kg to 3,904 mg/kg, with the highest concentration detected at a surface seep location. The concentrations of arsenic ranged from 7.1 mg/kg to 224 mg/kg. The elevated concentrations are likely the result of surface water runoff coming into contact with slag and other debris prior to reaching the creek. Site 1 sediment samples were also analyzed for organic constituents. The highest number of organic analytes were detected in three (3) samples, two (2) of which were located at and near the seep (location 1A-A002 and 1C-A003) where darkly discolored soil and hydrocarbon odor were observed.

## *3. Site 1 Surface and Subsurface Soil Results*

Eighty-nine (89) X-Ray Fluorescence (XRF) surface soil readings were taken at surface soil grid locations located on Site 1





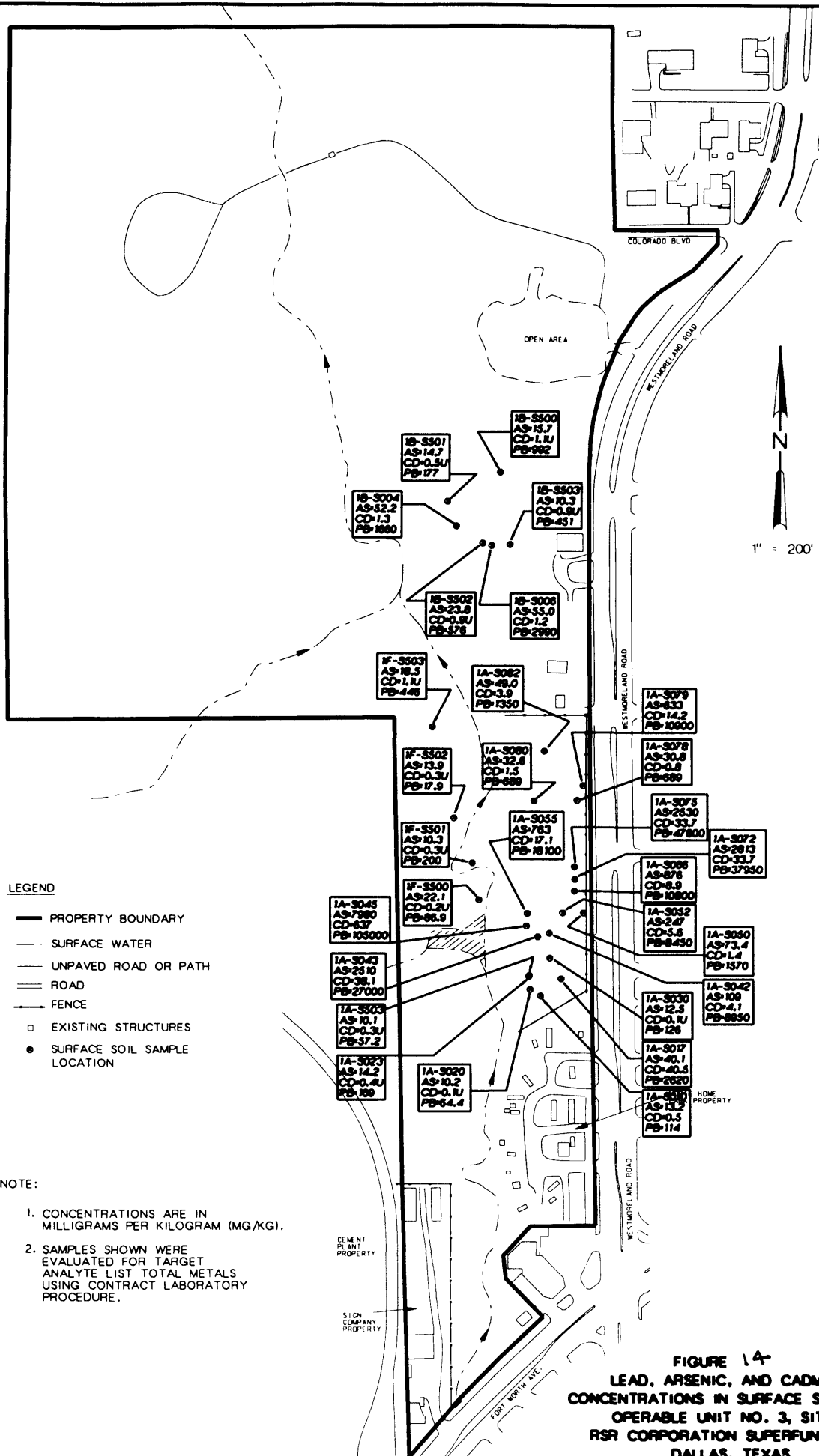
primarily in the visible slag and/or battery chip disposal areas. The XRF lead concentrations ranged from 28 mg/kg to 22,640 mg/kg. Arsenic was detected at only one (1) XRF location at a concentration of 1,481 mg/kg, and cadmium was detected at only six (6) XRF locations up to 576 mg/kg. Based primarily on the XRF readings, soil samples from twenty-five (25) grid locations were collected for laboratory analysis of Target Analyte List (TAL) inorganics. **Figure 14** illustrates the locations of these samples, along with the concentrations of lead, arsenic, and cadmium detected in the soil samples. Four (4) samples were also collected from background locations for TAL analysis. The highest soil sample lead concentrations were detected from the central and western portions, and were coincident with areas where slag was observed over much of the ground surface. Arsenic was detected in all of the Site 1 surface soil samples at concentrations ranging from 10 mg/kg to 7,980 mg/kg, located in the area where most of the slag was observed. Cadmium concentrations were detected in seventeen (17) of the samples and ranged from 0.5 mg/kg to 637 mg/kg, also in the area where the slag was observed. Three (3) surface soils were also analyzed for TCLP inorganics. The results for the TCLP analysis are also shown in **Figure 15**. Only lead and cadmium was detected above regulatory levels (i.e. 5 mg/L for lead and 1 mg/L for cadmium) which define a waste material as hazardous by the characteristic of toxicity (**40 CFR Section 261.664**).

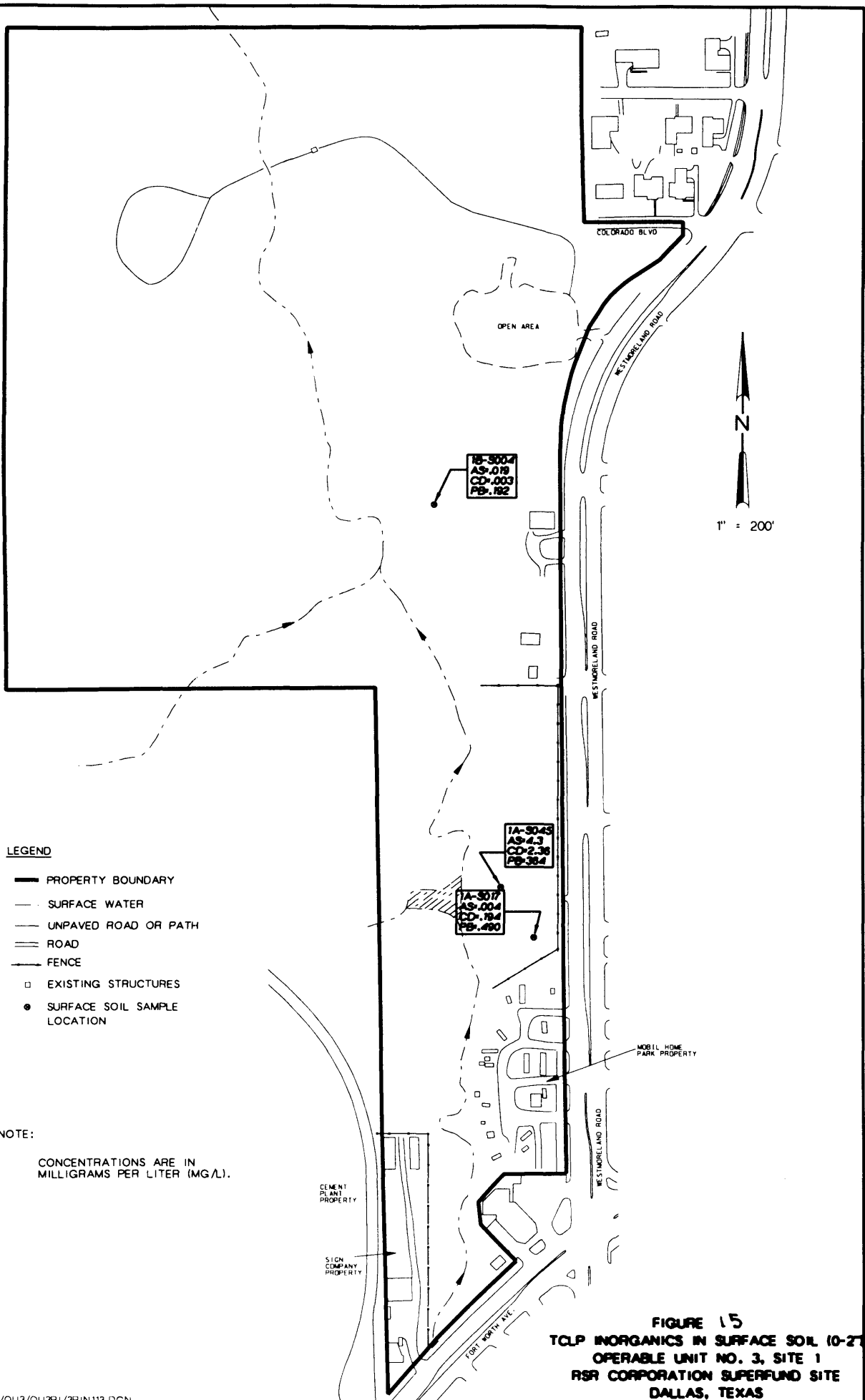
The maximum concentrations measured in the surface soils samples located in the four (4) background locations on Site 1 were 446 mg/kg lead, 22.1 mg/kg arsenic, and cadmium was not detected.

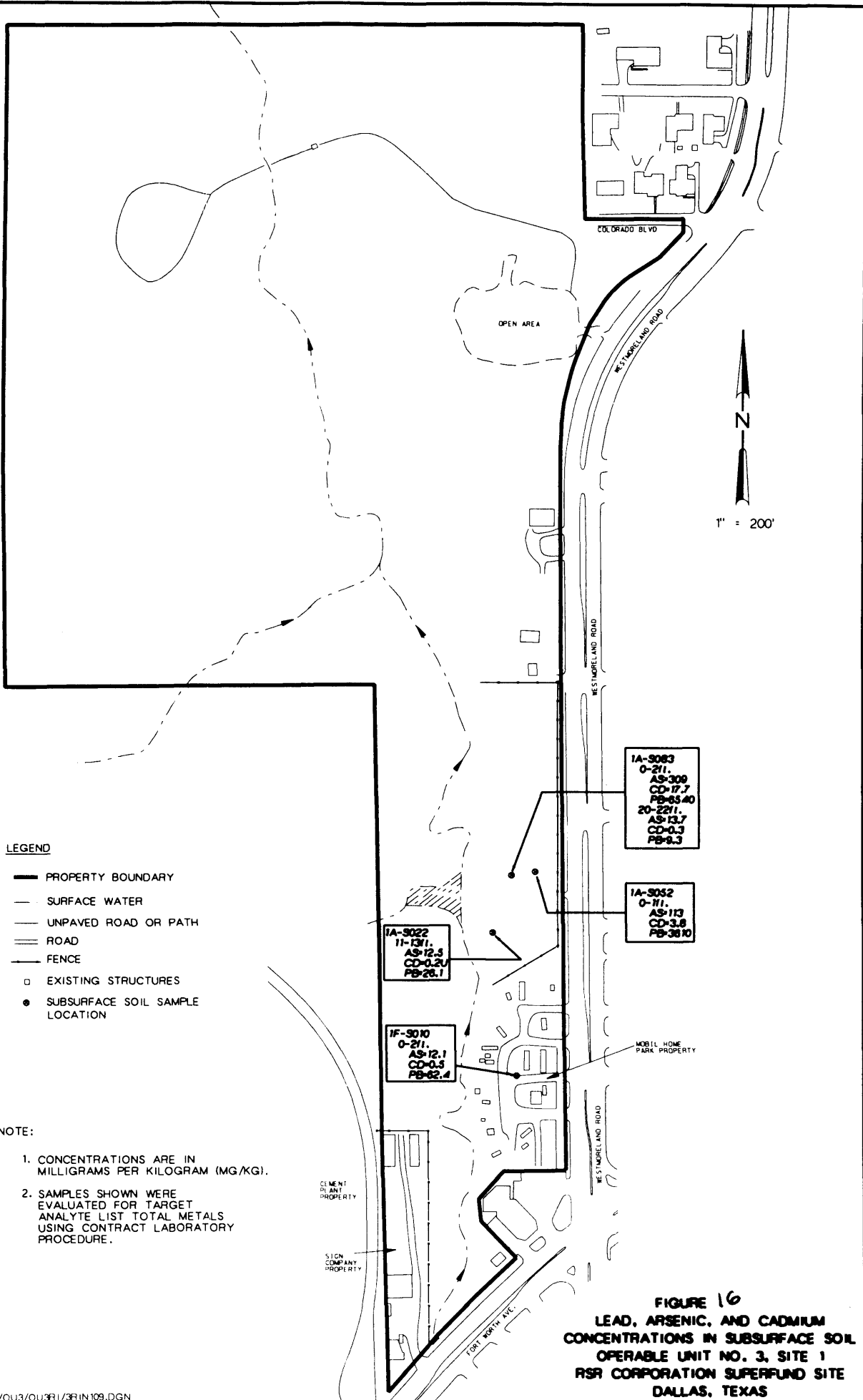
A total of five (5) subsurface soil samples were collected from borings drilled on Site 1. An illustration of the locations and range of concentrations of lead, arsenic, and cadmium is presented in **Figure 16**. The detected concentrations of these contaminants were higher in the shallow subsurface samples than in soil collected from deeper intervals. Lead concentrations ranged from 62.4 mg/kg to 6,540 mg/kg in the 0 to 2 foot interval, and were detected at concentrations only up to 26.1 mg/kg in samples collected from depths of eleven (11) and twenty-two (22) feet. Similarly, arsenic and cadmium were detected at concentrations up to 309 mg/kg and 17.7 mg/kg, respectively in the shallow samples, and up to 13.7 mg/kg and 0.31 mg/kg, respectively, in the deeper samples.

#### 4. Site 1 Ground Water Results

Two monitoring wells were installed on Site 1 at locations relatively close to the creek bank. These were the only







locations where a saturated zone was encountered in soil borings advanced on Site 1. The wells were screened in weathered Austin Chalk directly above the Eagle Ford Shale. Well 1A-S022 is screened from 15 to 25 feet and is located at the southern end of Site 1. Well 1A-S083 (screened from 16 to 26 feet bgs) is located near where slag was observed on and beneath the surface, and where relatively high concentrations of lead and arsenic were exhibited by the surface and subsurface soil. **Figure 17** illustrates the location of these wells, along with the concentrations of lead, arsenic and cadmium.

### **Site 3 - Nature and Extent of Contamination**

#### *5. Site 3 Surface Water and Sediment Results*

**Figure 18** illustrates the locations of the surface water and sediment samples collected from Site 3. Total lead concentrations exhibited by the surface water samples range from 1.2 ug/L to 1,700 ug/L. The highest total and dissolved lead concentration was exhibited by the sample located between the drainage separating the northern and southern cells of the West Davis Landfill. Other samples collected from this drainage, and from the eastern pond on the TXI Landfill, a seep on the west side of the TXI Landfill, and from Mountain Creek downstream of this seep, exhibited relatively high total lead concentrations (up to 191 ug/L). Piles of battery casing chips were observed near the TXI landfill pond, and along the drainage separating the cells of the West Davis Landfill.

Total arsenic was detected on three (3) Site 3 surface water samples at concentrations ranging from 16.6 ug/L to 47.1 ug/L, and dissolved arsenic was detected in thirteen (13) samples at concentrations up to 185 ug/L. Similar to the lead results, the higher concentrations of total and dissolved arsenic were exhibited by the samples collected from the drainage separating the northern and southern cells of the West Davis Landfill.

Total cadmium was detected in Site 3 surface water samples collected from Mountain Creek at Davis Street and from a seep on west side of the West Davis Landfill at concentrations of 0.5 ug/L and 0.98 ug/L, respectively. Dissolved cadmium was not detected in any of the surface water samples collected from Site 3.

The locations of the sediment samples collected on Site 3, as well as the concentrations of lead, arsenic and cadmium detected are illustrated in **Figure 19**. The range of lead and arsenic

# **LEGEND**

- PROPERTY BOUNDARY
- - - SURFACE WATER
- UNPAVED ROAD OR PATH
- == ROAD
- FENCE
- EXISTING STRUCTURES
- + GROUNDWATER SAMPLE LOCATION

## **NOTE:**

1. CONCENTRATIONS ARE IN MICROGRAMS PER LITER (µG/L).
2. SAMPLES SHOWN WERE EVALUATED FOR TARGET ANALYTE LIST TOTAL METALS USING CONTRACT LABORATORY PROCEDURE.

CEMENT  
PLANT  
PROPERTY

SIGN  
COMPANY  
PROPERTY

FORT WORTH AVE.

COLORADO BLVD

OPEN AREA

WESTMORELAND ROAD

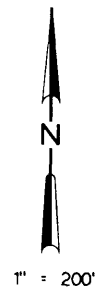
WESTMORELAND ROAD

WESTMORELAND ROAD

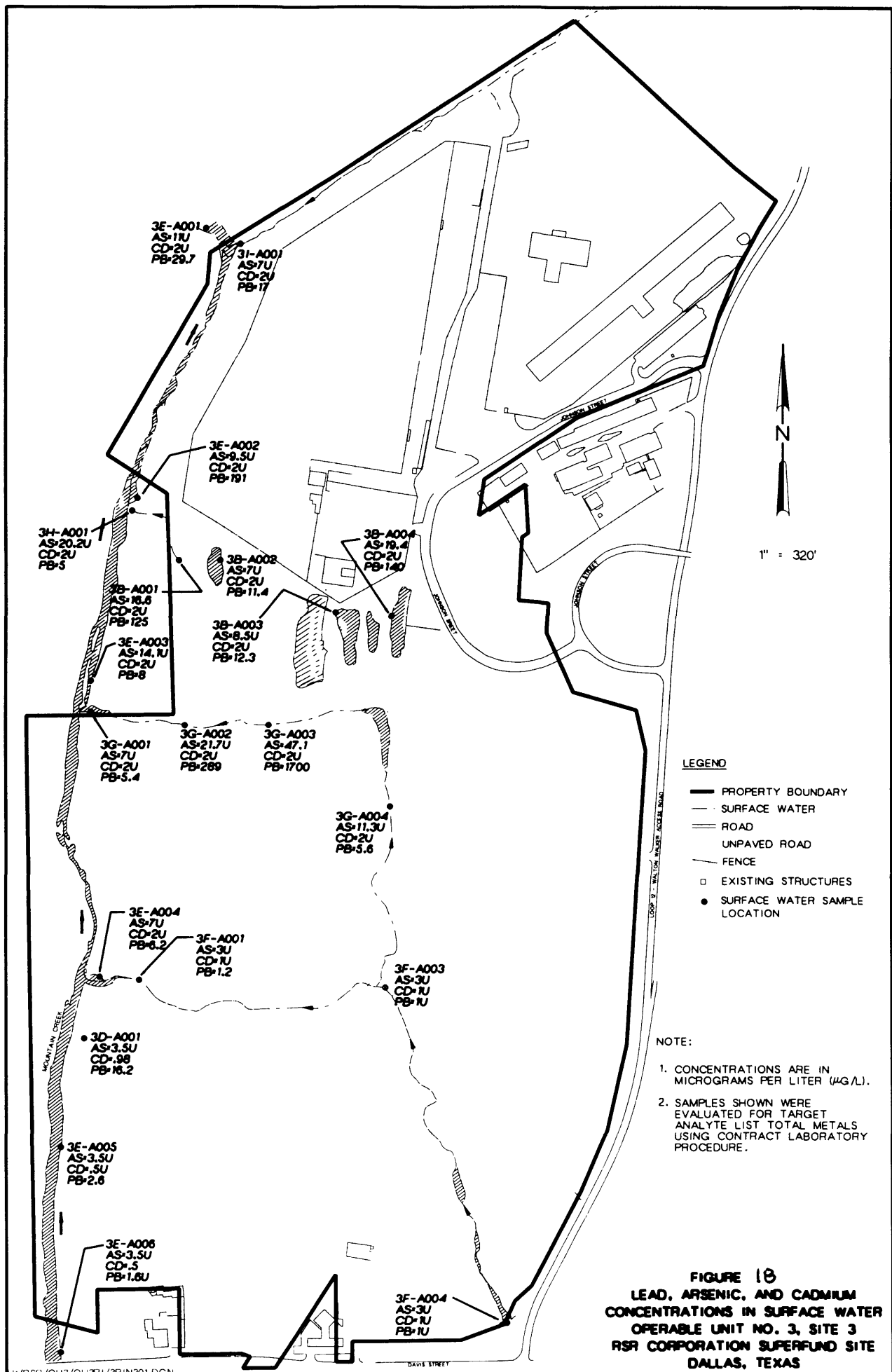
MOBIL HOME  
PARK PROPERTY

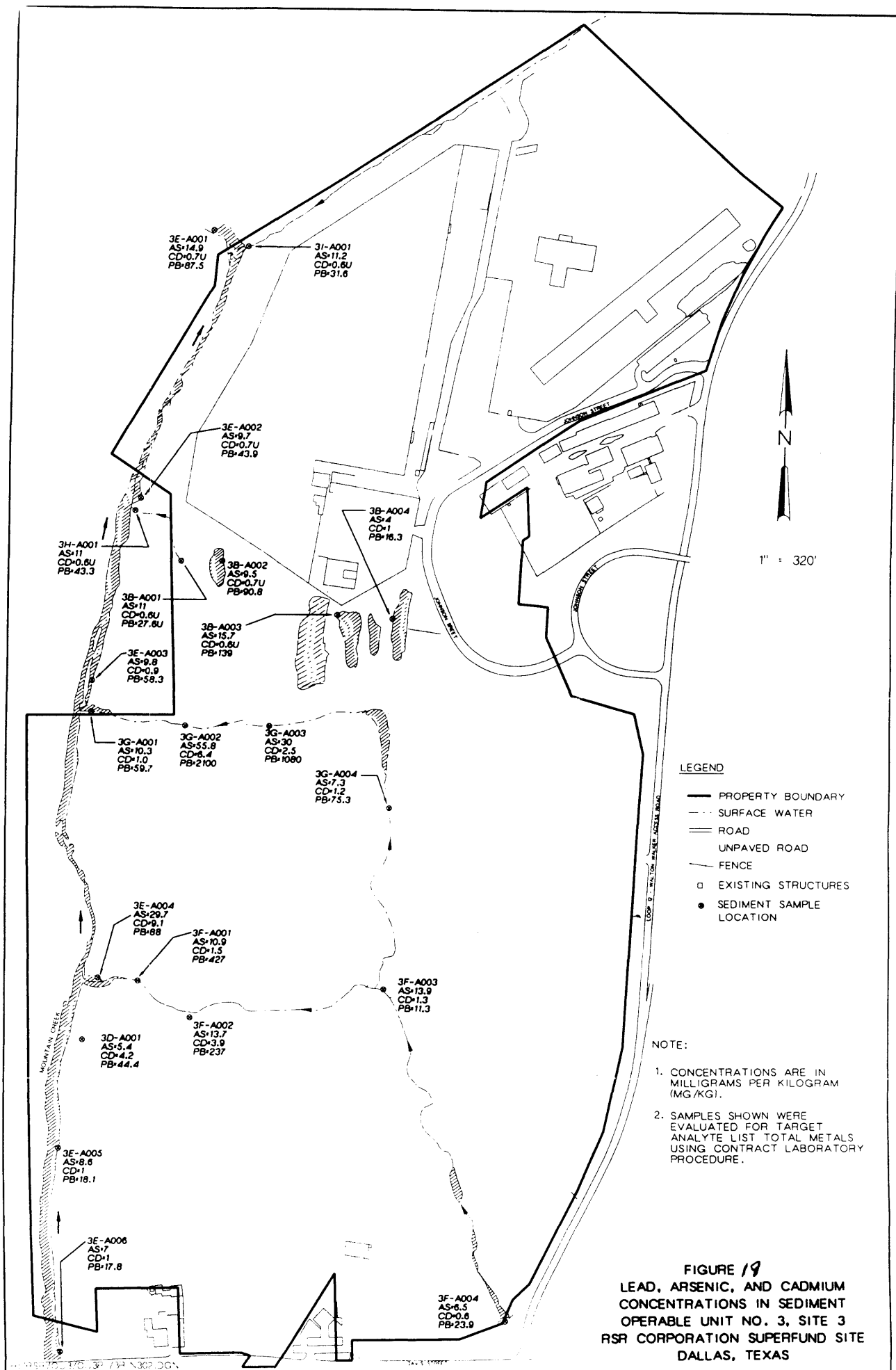
+1A-S083  
AS-3.5  
CD-11  
PB-5.7

+1A-S022  
AS-3.7  
CD-11  
PB-5.9



**FIGURE 17**  
**LEAD, ARSENIC, AND CADMIUM**  
**CONCENTRATIONS IN GROUNDWATER**  
**OPERABLE UNIT NO. 3, SITE 1**  
**RSR CORPORATION SUPERFUND SITE**  
**DALLAS, TEXAS**





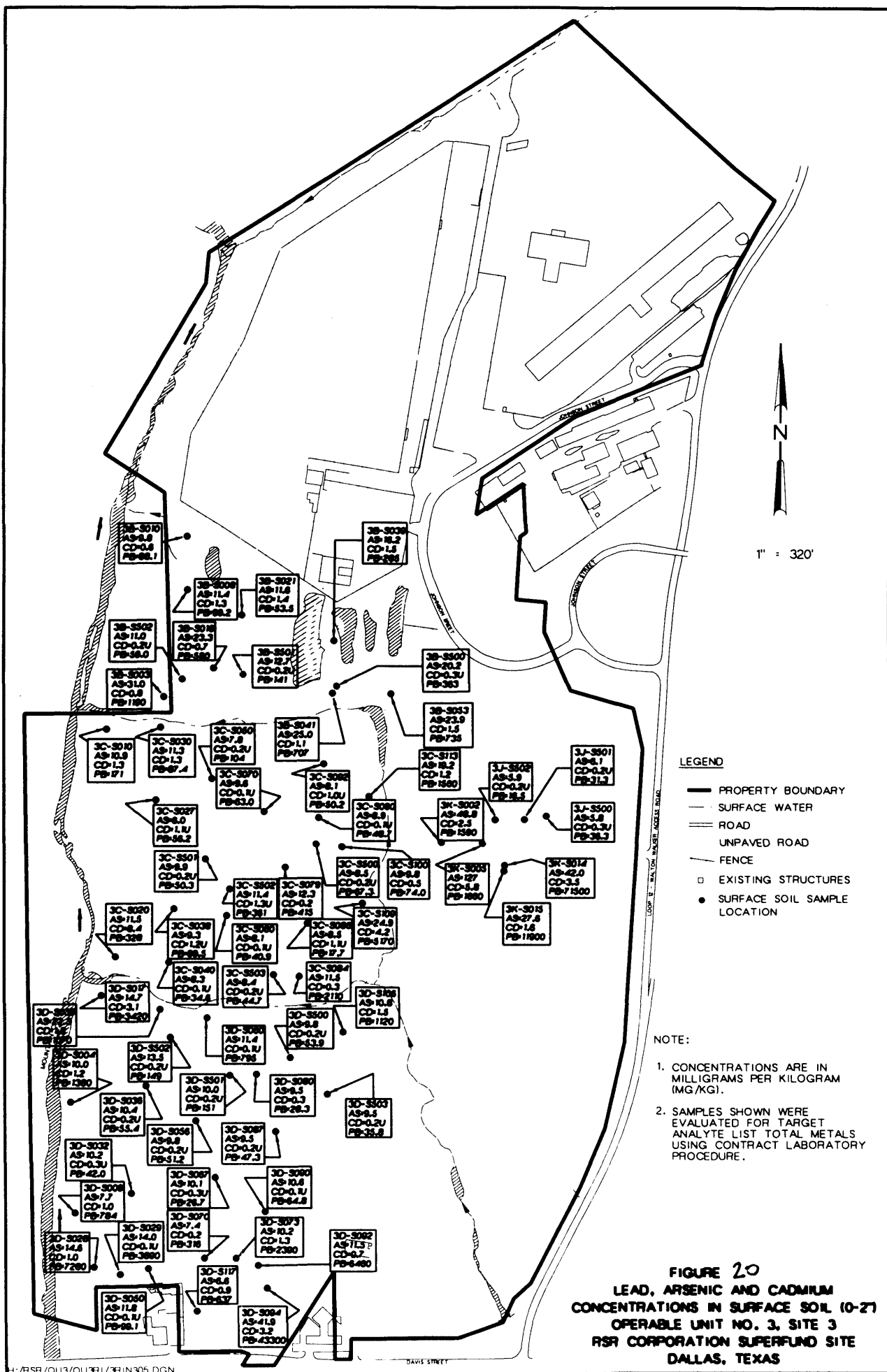
concentrations detected in the samples was 11.3 mg/kg to 2,100 mg/kg, and 4 mg/kg to 55.8 mg/kg, respectively. For comparison purposes, the maximum lead, arsenic, and cadmium concentrations expected in regional background soil are 30 mg/kg, 18 mg/kg, and 11 mg/kg, respectively. Other constituents that were detected at levels higher than the maximum regional background soil levels, were antimony and copper. Antimony was detected at concentrations up to 26.2 mg/kg (corresponding maximum background level is 2 mg/kg) and 213 mg/kg for copper (corresponding maximum background level is 30 mg/kg). The highest concentrations of lead and arsenic detected in the Site 3 sediment samples were collected from the drainage separating the TXI Landfill from the northern cell of the West Davis Landfill. Two (2) sediment samples analyzed for TCLP demonstrated a low detection of lead (0.0165 mg/L), and were below the level used to define a material as hazardous by the characteristic of toxicity.

#### 6. *Site 3 Surface and Subsurface Soil Results*

XRF analysis was performed at three-hundred six (306) grid nodes established approximately one-hundred (100) feet apart on Site 3, over the TXI Landfill, the northern and southern cells of the West Davis Landfill, and an area adjacent to the West Davis Landfill where battery chips were observed over much of the ground surface. XRF analysis was not conducted over the Dalhstrom Landfill, due to the lack of observed evidence of battery chips or slag on the ground surface, which is paved and covered with gravel (now an auto salvage yard). Lead was detected at one-hundred sixty-one (161) grid nodes at concentrations ranging from 18 mg/kg to 29,260 mg/kg; arsenic was detected at ninety-six (96) grid nodes at concentrations ranging from 25 mg/kg to 141 mg/kg; and cadmium was detected at only three (3) grid nodes, where concentrations ranged from 59 to 96 mg/kg.

Sixty-four (64) surface soil samples were also collected from Site 3 for laboratory analysis (i.e. TAL inorganics). **Figure 20** illustrates the locations of these samples, along with the concentrations of lead, arsenic and cadmium. The concentrations of lead and arsenic detected in all samples ranged from 16.5 mg/kg to 71,500 mg/kg, and from 5.75 mg/kg 127 mg/kg, respectively. Cadmium was detected in thirty-two (32) samples at concentrations up to 8.4 mg/kg. The highest lead concentrations generally coincided with locations where battery chips were observed.

A total of nine (9) Site 3 surface soil samples were analyzed for TCLP inorganics. Lead concentrations exhibited by two (2) of



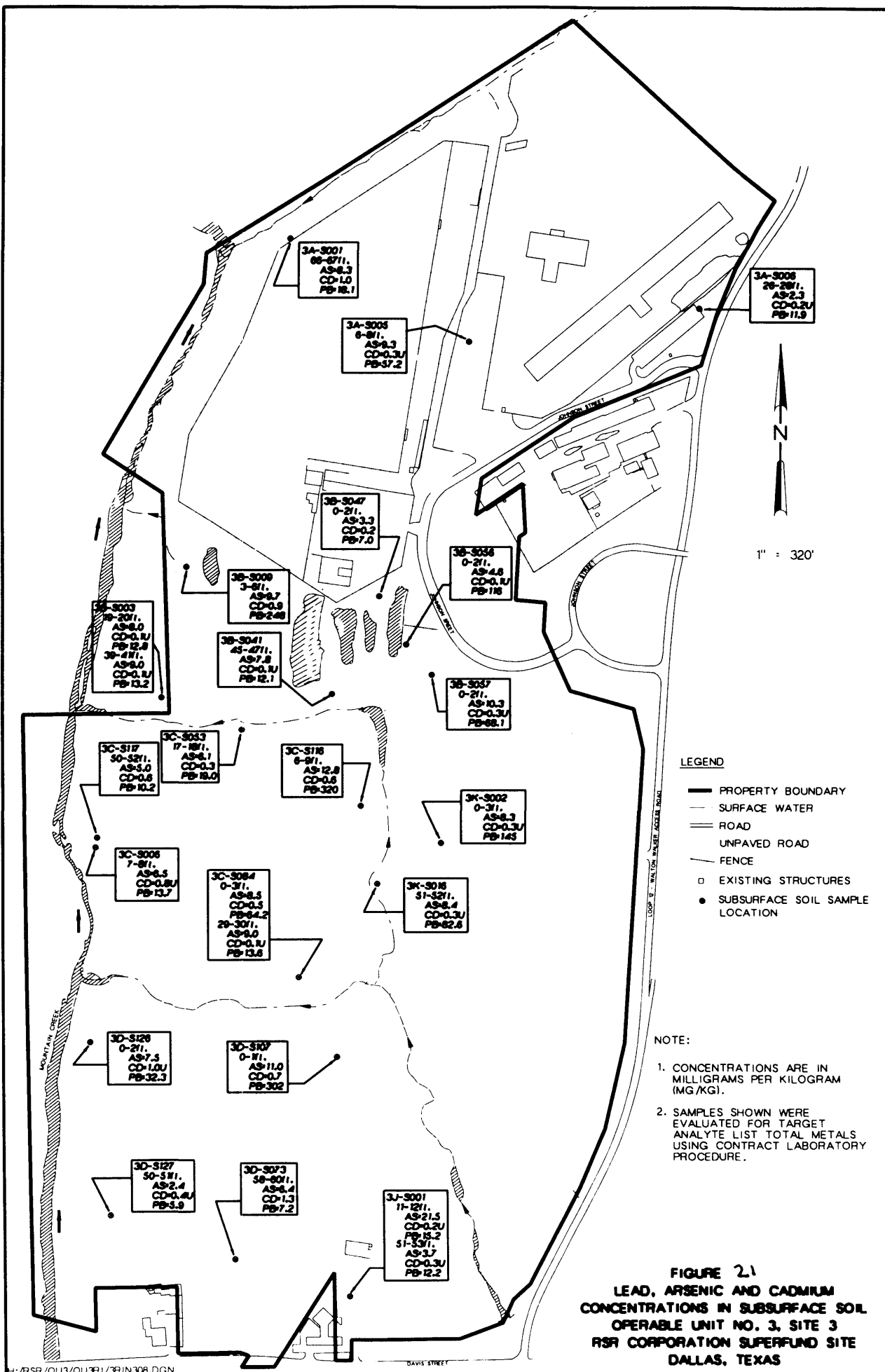
these samples exceeded the 5 mg/L level used to define a waste material as hazardous by the characteristic of toxicity.

The maximum lead and arsenic concentrations detected from the background locations were 36.3 mg/kg and 6.1 mg/kg.

Soil vapor samples were also collected from seven (7) of the boring locations on Site 3 as part of the landfill gas investigation at OU No. 3. The only organic analytes detected in these samples were chlorobenzene, methane, and vinyl chloride. Chlorobenzene was detected in three (3) samples at concentrations up to 6,700 ppm. Vinyl Chloride was detected in four (4) samples at concentrations up to 5,000 ppm. Methane was detected in nine (9) samples at concentrations up to 232,000 ppm (with the highest concentration detected by a sample on the east side of the Dahlstrom Landfill). Vinyl chloride and methane concentrations generally were highest in the area surrounding the Dahlstrom Landfill, and in the TXI Landfill.

Soil vapor samples collected from ten (10) feet and twenty (20) feet bgs at a background location exhibited low concentrations of methane (2.8 ppm and 2.0 ppm, respectively). The sample collected from 20 feet bgs also exhibited a chlorobenzene concentration of 6,700 ppm.

Direct push borings were advanced at sixteen (16) locations around the landfill perimeters on Site 3, to depths between 4 and 31.5 feet bgs in order to characterize the subsurface conditions. In addition, twenty-one (21) auger borings were advanced to depths between 13 and 72.5 feet bgs. **Figure 21** shows the locations of the subsurface samples, along with the concentrations of lead, arsenic and cadmium. Detected concentrations of lead generally were higher in shallow subsurface samples (0 to 3 feet bgs) than in soil from deeper intervals. Lead concentrations ranged from 7 mg/kg in samples collected from 0 to 3 feet bgs, and up to 82.6 mg/kg in samples collected from depths of 3 to 67 feet. At one (1) boring location (3B-S009), battery casing chips were observed in soil core samples collected from depths up to 8 feet bgs. Generally, arsenic concentrations in the shallow subsurface (up to 11 mg/kg) were nearly the same or slightly higher than arsenic concentrations from greater depths (up to 9.7 mg/kg). In the subsurface samples cadmium was detected up to 1.3 mg/kg. TCLP lead concentrations exhibited by four (4) of the nine (9) samples at depths between 0 to 12 feet bgs, ranging from 20.5 mg/L to 44.1 mg/L, significantly exceeded the 5 mg/L level used to define waste material as hazardous by the characteristic of toxicity.



The concentration of lead and arsenic detected at the background subsurface soil location was 15.2 mg/kg and 21.5 mg/kg, respectively.

#### *7. Site 3 Ground Water Results*

During the Site 3 ground water investigation, eight (8) monitoring wells (two (2) per landfill cell) were installed in the landfill water-bearing zone on Site 3, at depths ranging from 9 to 40.4 feet bgs. An additional ten (10) wells were installed in the alluvial water bearing zone at depths ranging from 15 to 72 feet bgs. The locations of these wells, along with the concentrations of lead, arsenic and cadmium detected in the monitoring wells on Site 3 are illustrated in **Figure 22**.

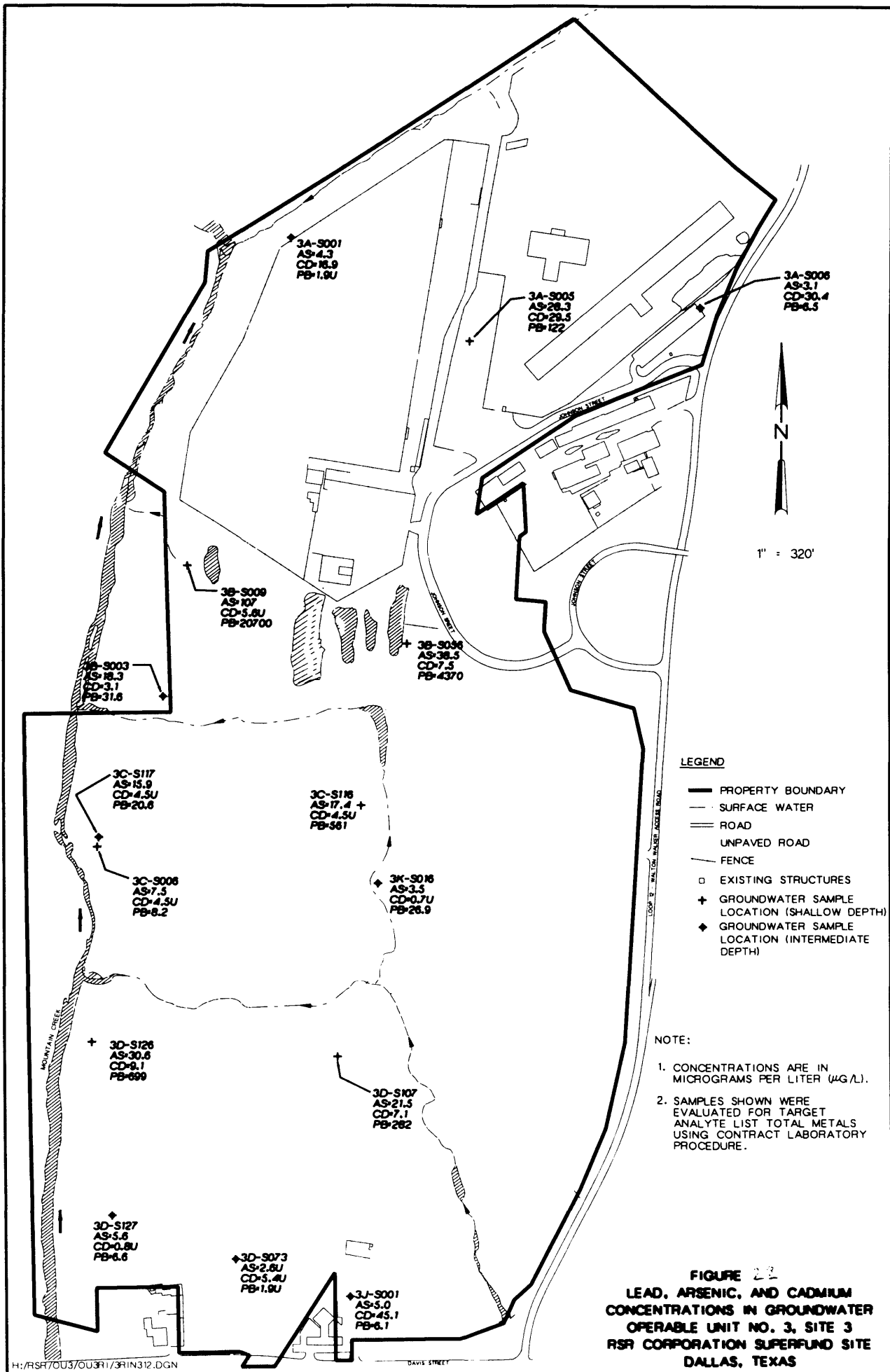
Total lead and arsenic was detected in all seven (7) ground water samples collected from the water-bearing landfill debris zones, at concentrations ranging from 8.2 ug/L to 20,700 ug/L, and from 7.5 ug/L to 107 ug/L, respectively. Total cadmium was detected in four (4) of these samples at concentrations up to 29.5 ug/L. Total Dissolved Solids (TDS) concentrations ranged from 598,000 ug/L to 4,080,000 ug/L. The high concentrations of lead detected in several wells, and arsenic and antimony in one (1) well, may be attributed to the presence of waste materials in the landfill, including battery chips (which were observed in the core samples at those locations).

Ground water samples collected from wells screened in the water-bearing alluvial zone exhibited total lead concentrations ranging from 6.1 ug/L to 31.6 ug/L in six (6) of the eight (8) samples. Total arsenic was detected in seven (7) samples at concentrations ranging from 3.1 ug/L to 18.3 ug/L, and total cadmium was detected in four (4) samples at concentrations ranging from 3.1 ug/L to 45.1 ug/L. TDS concentrations of these samples ranged from 3,840,000 ug/L to 12,000,000 ug/L.

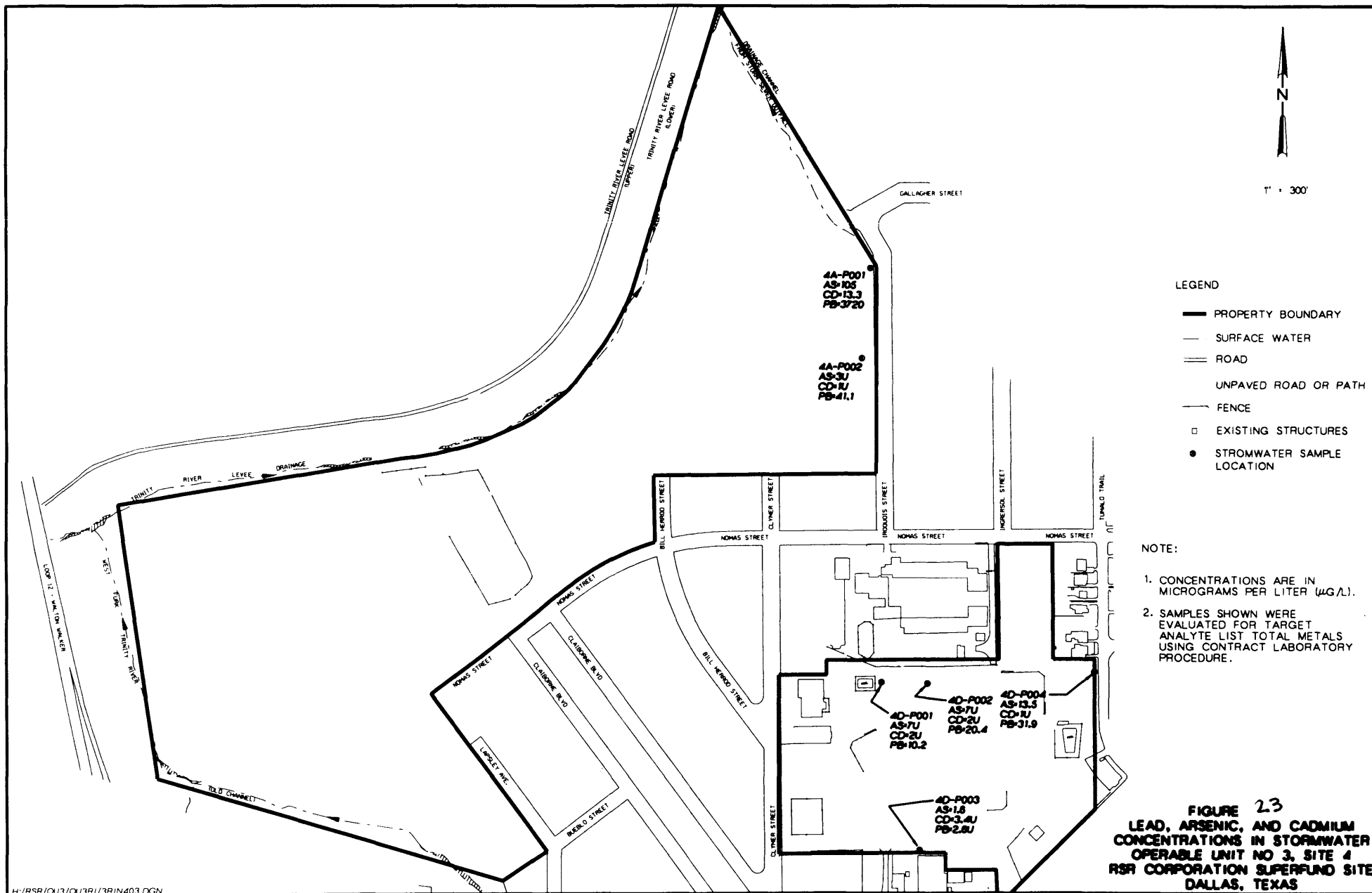
### **Site 4 - Nature and Extent of Contamination**

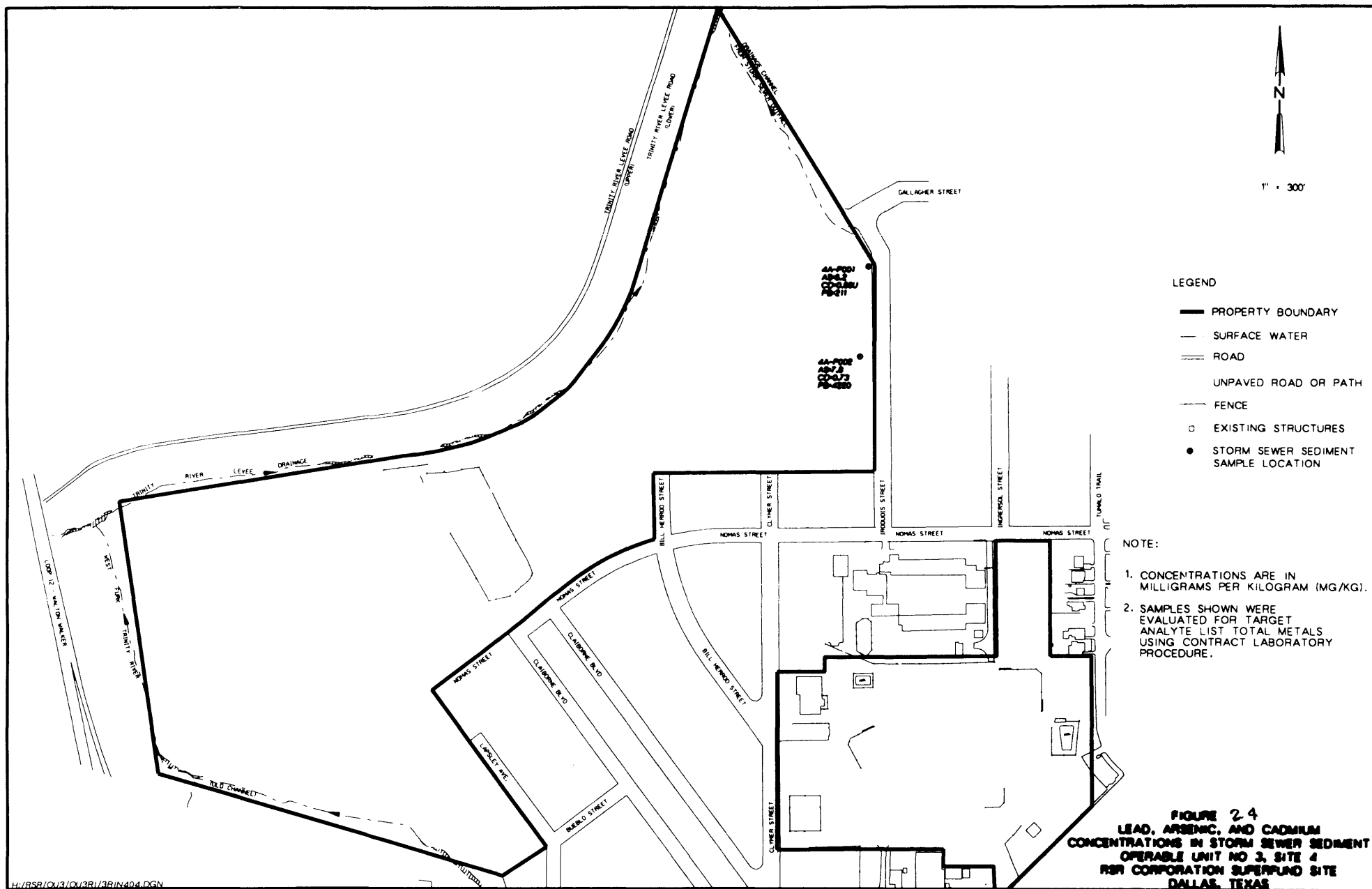
#### *8. Site 4 Storm Sewers and Drainages Results*

**Figures 23 & 24** show the locations of the six (6) storm sewer locations on Site 4, in addition to the concentrations of lead, arsenic and cadmium detected in the storm water and sediment samples, respectively. The storm water sample collected from the storm sewer inlet (location 4A-P001), located on the east side of the Vilbig Landfill, displayed elevated levels of inorganic constituents, including lead, arsenic and cadmium at levels of



**FIGURE 2.2**  
**LEAD, ARSENIC, AND CADMIUM**  
**CONCENTRATIONS IN GROUNDWATER**  
**OPERABLE UNIT NO. 3, SITE 3**  
**RSR CORPORATION SUPERFUND SITE**  
**DALLAS, TEXAS**



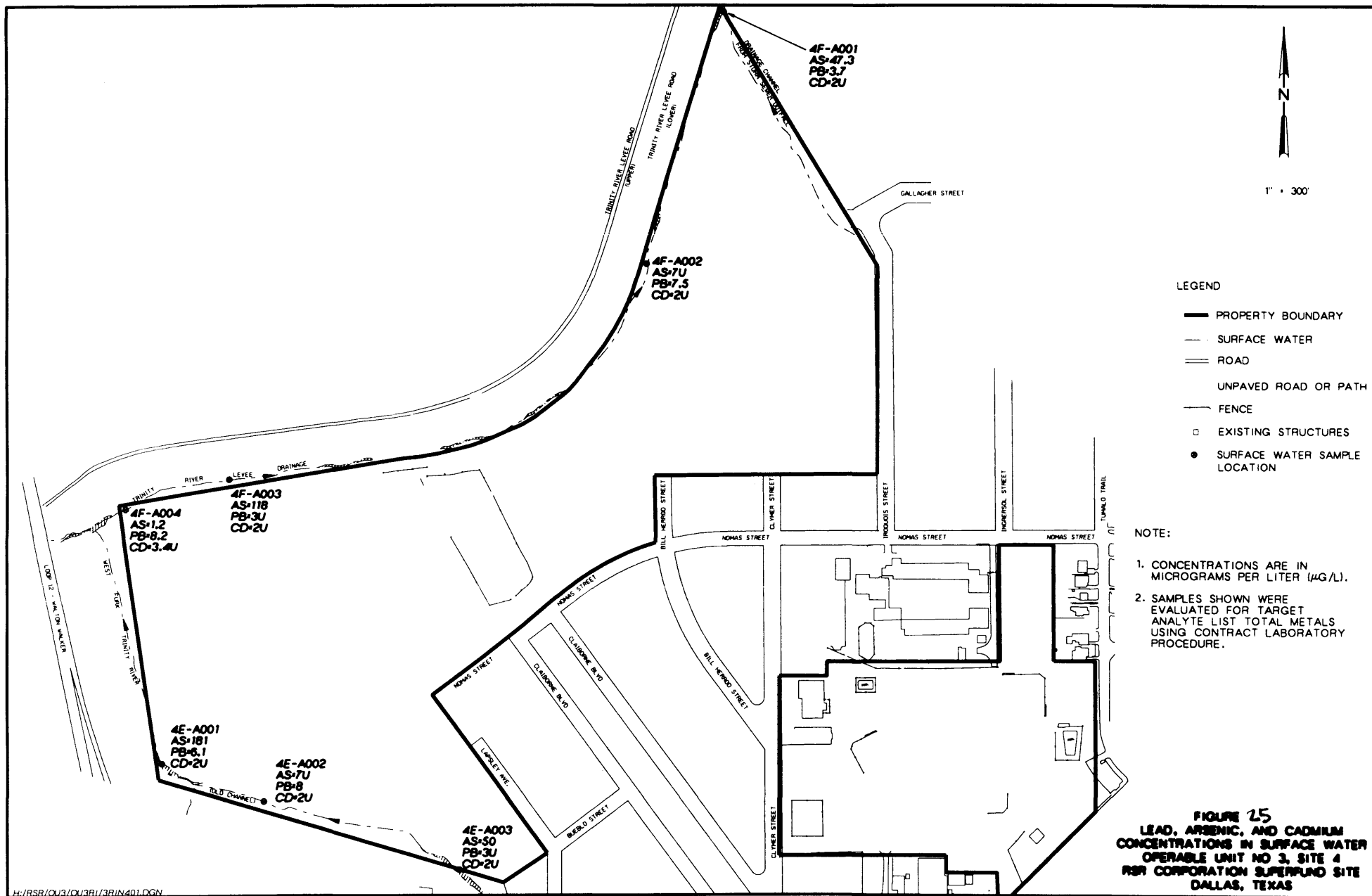


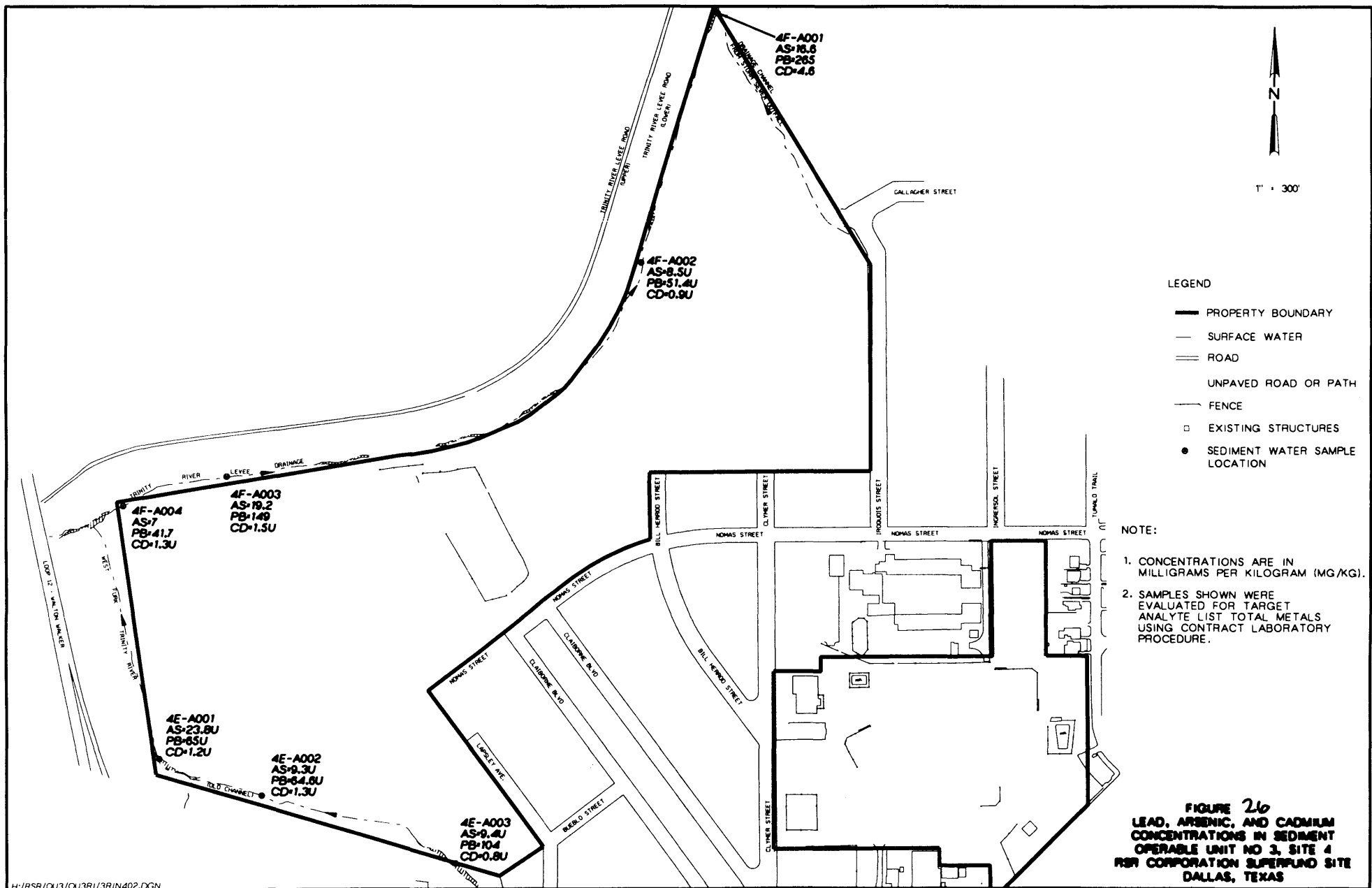
3,720 ug/L, 105 ug/L and 13.3 ug/L, respectively. These elevated concentrations may be attributed to high levels of inorganics present in stormwater runoff from Iroquois and Gallagher streets, or from uncontrolled surface dumping in the vicinity of the inlet (which was observed during the course of the RI investigations). The concentrations of lead detected in the other storm water samples had concentrations that ranged up to 41.1 ug/L. Total arsenic was detected in two (2) other storm water samples at levels up to 13.5 ug/L and cadmium was not detected in any other storm water samples from Site 4. The sediment sample concentrations detected on Site 4 ranged from 211 mg/kg to 4,220 mg/kg of lead, 6.2 mg/kg to 7.8 mg/kg of arsenic and 0.73 mg/kg cadmium (detected in only one sample). The arsenic and cadmium levels were below the expected regional background levels of 18 mg/kg and 11 mg/kg, respectively.

#### 9. Site 4 Surface Water and Sediment Results

Seven (7) surface water and sediment sampling locations were selected on Site 4; four (4) located within the drainage that flow east between the north side of Site 4 and the south side of the Trinity River Levee, and three (3) located within the Old Channel of the West Fork of the Trinity River. **Figures 25 & 26** illustrate the concentrations of lead, arsenic and cadmium detected in the surface water and sediment samples, respectively. Total lead was detected in two of the samples collected from the Old Channel of the Trinity River at concentrations of 8 ug/L and 6.1 ug/L, and in three (3) of the samples from the levee drainage at concentrations ranging from 3.7 ug/L to 8.2 ug/L. Total arsenic was detected in nearly all of the Site 4 surface water samples at levels up to 181 ug/L. Total cadmium was not detected in any of the Site 4 surface water samples. There was no apparent pattern to the occurrence of the lead and arsenic in the surface water samples.

In the sediment sampling, lead was detected in four (4) samples at concentrations ranging from 41.7 mg/kg to 265 mg/kg. Arsenic was detected in three (3) samples from the levee drainage at levels ranging from 7 mg/kg to 19.2 mg/kg and cadmium was only detected in one (1) sample at concentration of 4.6 mg/kg. Metal concentrations were generally higher in the sediment samples collected from the levee drainage than those from the Old Channel of the Trinity River. In particular, lead, arsenic and zinc levels shown by the sample near the northwest corner of Site 4 were the highest detected in the Site 4 sediment samples. Two (2) of the sediment samples were analyzed for TCLP, and detected concentrations of lead, arsenic and cadmium were below the





corresponding levels for these constituents used to define a hazardous waste by the characteristic of toxicity.

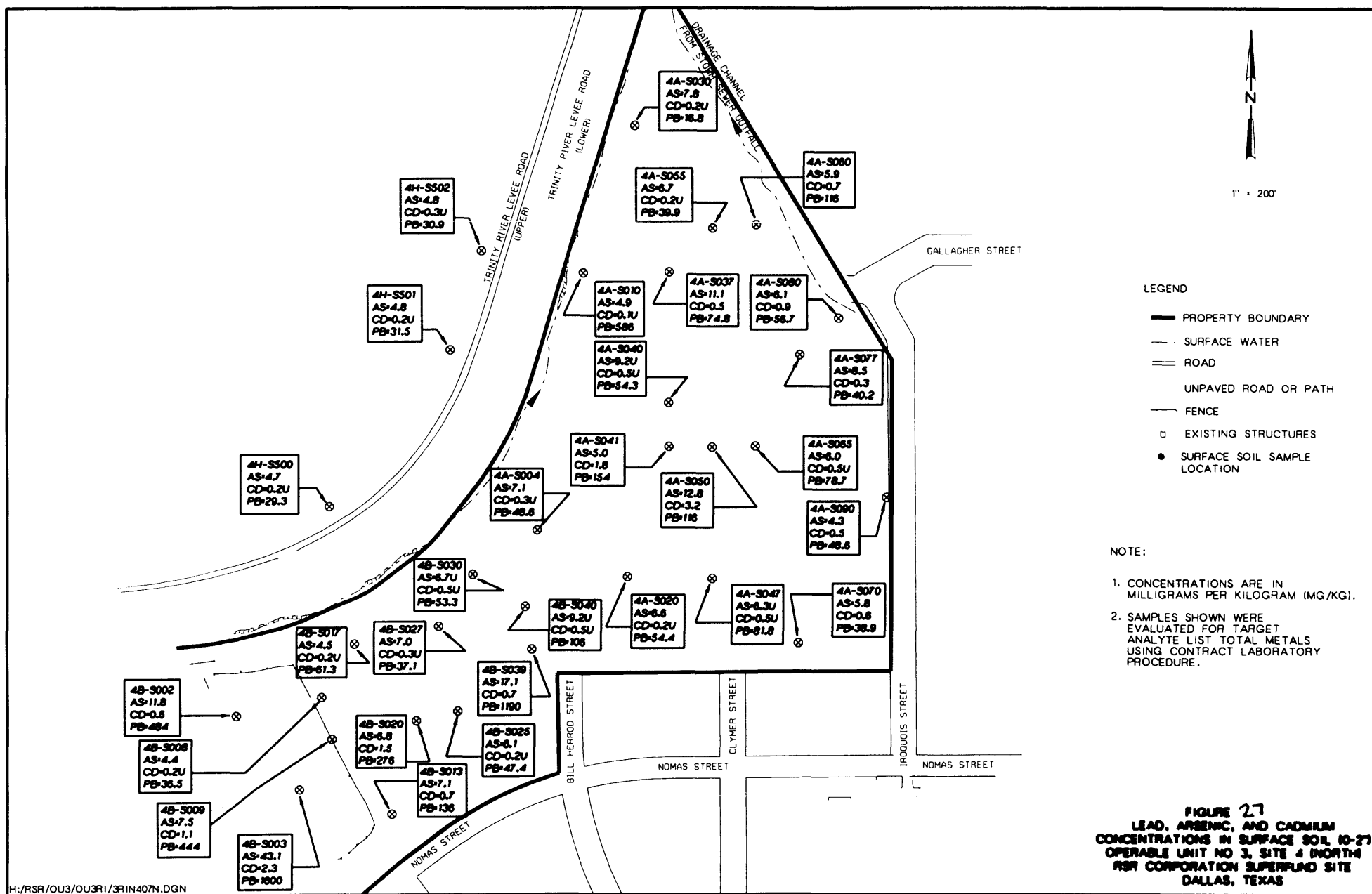
#### 10. *Site 4 Surface and Subsurface Soil Results*

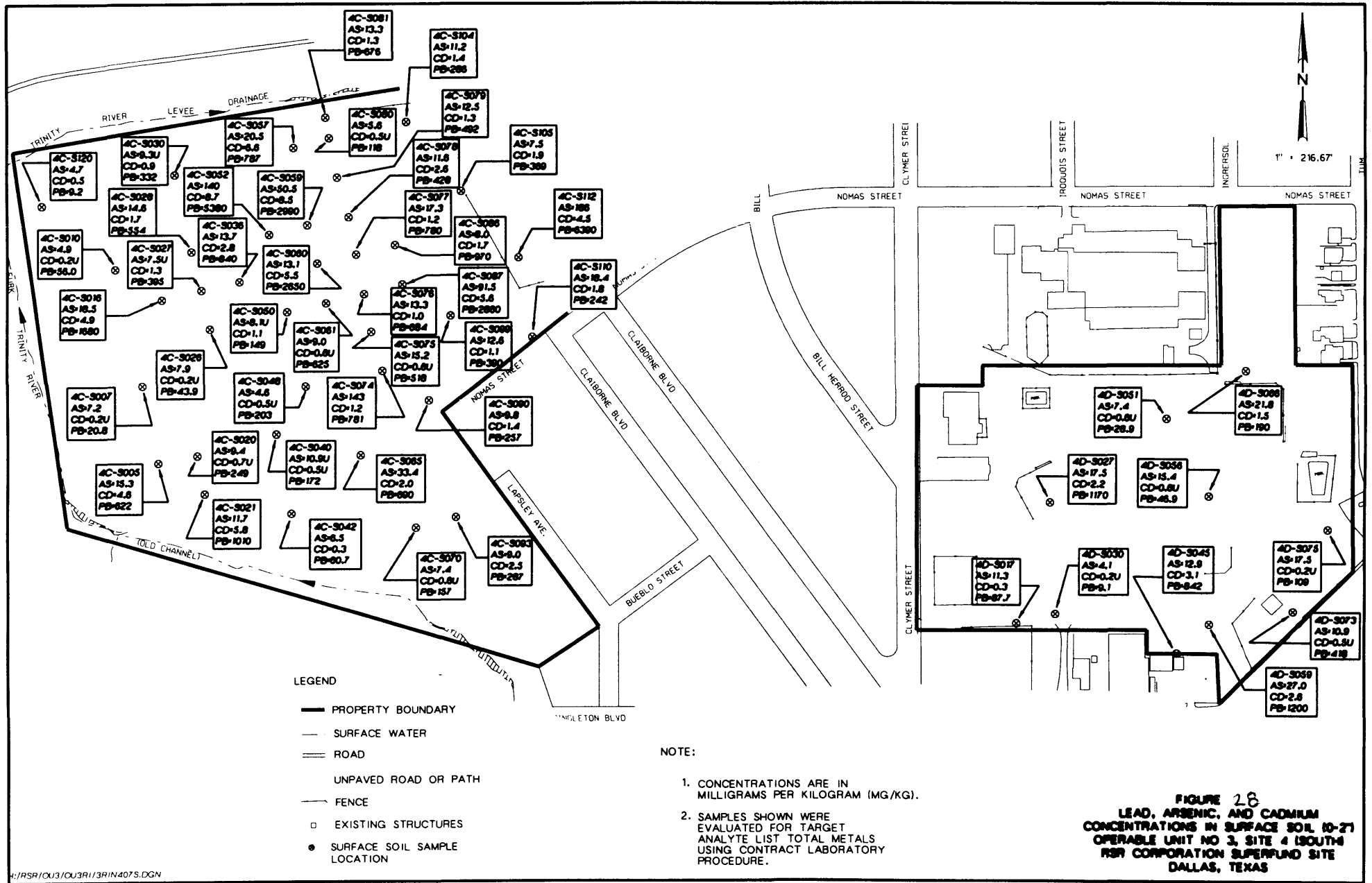
Surface soil grid nodes were established approximately 100 feet apart on Site 4, at the Vilbig Landfill, the Nomas Landfill, and the West Dallas Landfill and approximately 50 feet apart on the Jaycee Park for XRF analysis. Lead was detected by XRF above the detection limit up to 2,485 mg/kg and higher levels were exhibited by samples from the center of the West Dallas Landfill. XRF arsenic was detected at concentrations up to 63 mg/kg, with higher levels shown by samples collected primarily from the Jaycee Park Landfill and the eastern side of the Vilbig Landfill. Cadmium was only detected by XRF at five (5) locations at levels up to 79 mg/kg.

The results of the laboratory analysis of surface soil samples for lead, arsenic and cadmium are illustrated in **Figure 27 (northern portion) and Figure 28 (southern portion)**. Lead detected in these samples ranged from 9.1 mg/kg to 6,390 mg/kg and arsenic was detected up to 186 mg/kg, with the highest levels shown by samples from the West Dallas landfill. These elevated concentrations generally coincided with the presence of battery chips. Cadmium was detected at concentrations up to 8.7 mg/kg. In addition, six (6) surface soils samples were submitted for TCLP analysis. Although, inorganic constituents such as lead, arsenic and cadmium were detected in one (1) or more of the samples for TCLP analysis, none were above regulatory levels.

Three samples were also collected from background locations on Site 4. The concentrations of lead, arsenic and cadmium detected were 31.5 mg/kg, 4.8 mg/kg and not detected, respectively.

On Site 4, nineteen (19) direct push borings were advanced at locations based on the surface soil XRF results and the proximity of the boring to the expected landfill perimeter. These borings were advanced to refusal, which generally occurred at the top of the Eagle Ford Shale formation, at depths ranging from 7 feet to 27 feet bgs. In addition, fourteen (14) auger borings were advanced to depths between 14 and 26.5 feet bgs. During both the direct push and auger drilling activities, a total of thirty-two (32) of these samples were submitted for TAL analysis. An illustration of the detected concentrations of lead, arsenic, and cadmium from the TAL analysis in the subsurface soil samples is shown in **Figure 29**. Generally, the inorganic concentrations were higher in the shallow subsurface samples than in soil from the deeper intervals. Lead concentrations ranged from 12.6 mg/kg to







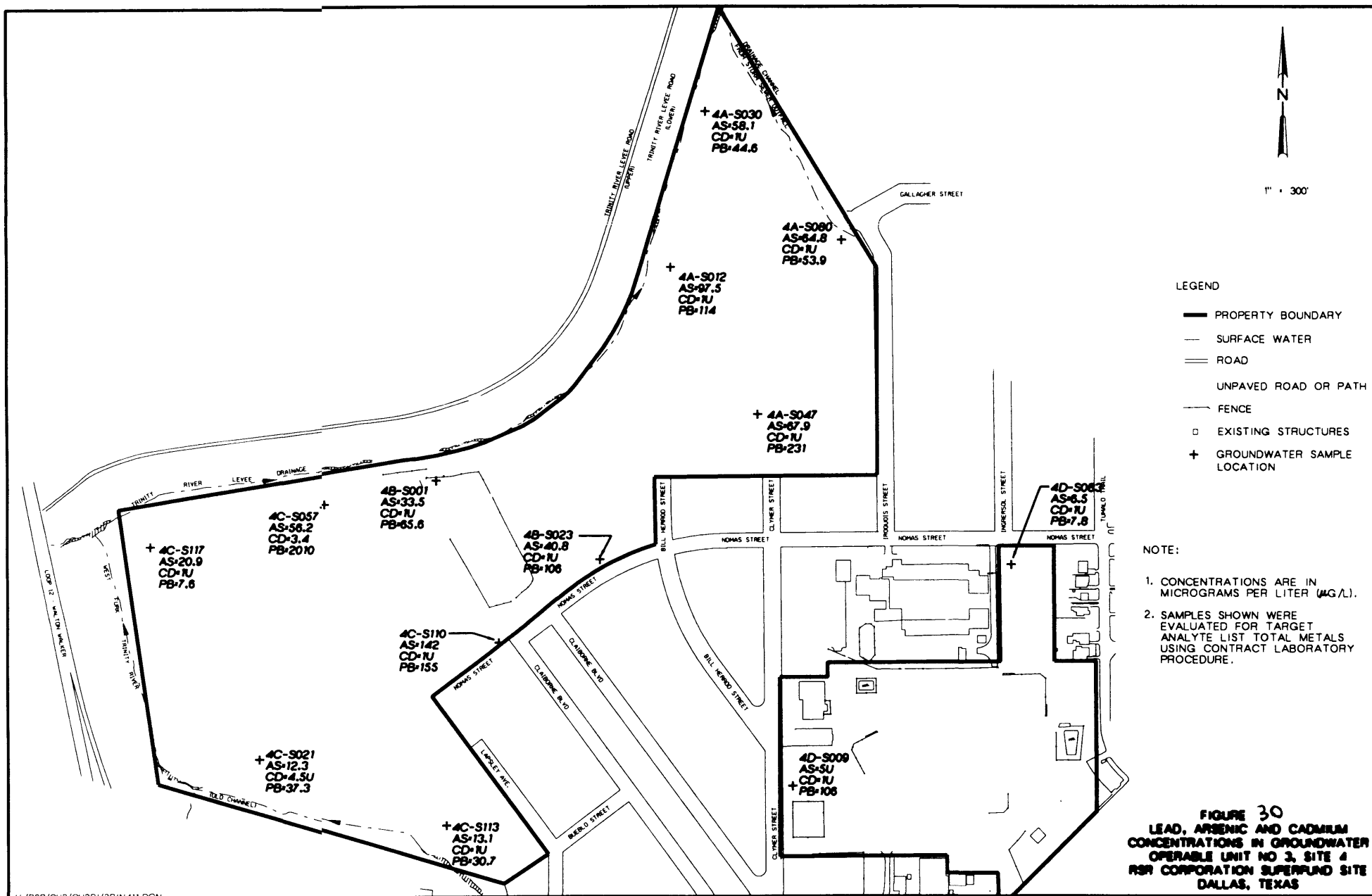
11,500 mg/kg in the samples collected from 0 to 3 feet bgs, and lead detected at concentrations up to 2,060 mg/kg in the samples collected from 3 to 26.5 feet bgs. Similarly, arsenic and cadmium concentrations were detected at concentrations up to 114 mg/kg and 15.1 mg/kg, respectively, in samples collected from 0 to 3 feet bgs, and up to 58.5 mg/kg and 4.8 mg/kg, respectively, in samples collected from 3 to 26.5 feet bgs. Four (4) subsurface soil samples were also collected for TCLP analysis. Lead was detected in all four samples, arsenic detected in one sample and cadmium detected in three samples. Only one TCLP sample lead level was slightly above the regulatory level used to define a hazardous waste and that was sample 4B-S003, with a concentration of 5.87 mg/L.

At the background location, located near the northeast corner of Jaycee Park, the levels of inorganics exhibited by the subsurface soil sample (9 to 12 feet bgs) were 10.2 mg/kg of lead, 5.7 mg/kg of arsenic and cadmium was not detected.

#### 11. *Site 4 Ground Water Results*

As part of the Site 4 ground water investigation, thirteen (13) monitoring wells were installed. Four (4) wells were installed on the Vilbig Landfill, two (2) were installed on the Nomas landfill, five (5) were installed in the West Dallas landfill, and two (2) were installed in the Jaycee Park landfill. One well located in the Jaycee Park area was designated as the background well due to the lack of evidence of landfill debris, slag, battery chips or other visual signs of contamination on the surface or subsurface. Each of the wells were screened in a water-bearing sand and gravel (which in some locations had been displaced by or mixed with landfill debris) directly overlying the Eagle Ford Shale, at depths ranging from 13 to 26 feet bgs. The locations of these wells, along with the levels of lead, arsenic and cadmium detected in the monitoring wells on Site 4 are shown in **Figure 30**.

Total lead was detected in all ground water monitoring samples with concentrations ranging from 7.6 ug/L to 2,010 ug/L. Total arsenic was detected in most of the samples at concentrations up to 142 ug/L, and cadmium was detected in only one sample at 3.4 ug/L. In general, the distribution of inorganics detected in the Site 4 ground water demonstrated no particular pattern. Lead and arsenic concentrations were slightly higher along the southern perimeter of Site 4. Localized elevated concentrations of lead and arsenic, may be attributable to nearby isolated sources, such as battery chips.



The ground water sample from the background well exhibited total lead and arsenic concentrations of 7.75 ug/L and 6.5 ug/L, respectively, and cadmium was not detected in this well.

L. Estimated Hydraulic Characteristics of Shallow Ground water at the OU No. 3 Sites

Ground water elevations measured in the Site 1 monitoring wells, combined with the information on the surface seeps and creeks, were used to estimate that the gradient of the shallow ground water is to the west and recharging the creek.

The geologic and hydrogeologic information from Site 3 indicates that shallow ground water is present in both shallow water-bearing landfill debris zones and in water-bearing alluvium, generally above bedrock. Due to the presence of landfill debris zones and surface water drainages intercepting ground water flow in the alluvial material, ground water flow contours for Site 3 could not be developed. However, it is likely the alluvial materials generally migrate toward Mountain Creek and the nearby drainages.

The shallow subsurface geology and presumed depositional environment of Site 4 is similar to that of Site 3. The ground water gradient is to the west and to the north, toward the surface water drainages bounding Site 4.

The monitoring wells installed at Site 1 and several of the wells at Sites 3 and 4 demonstrated relatively low yield, and several of the wells were pumped dry during well purging. The yield of the alluvial deposits encountered in the shallow subsurface at the OU No. 3 sites is likely to be less than one gallon per minute in most places.

The shallow ground water at each of the OU No. 3 sites is not considered a potential drinking water supply due to the overall low yield, the slightly saline quality and the availability of the City of Dallas water supply, as well as potable supply permitting requirements. In addition, the expected migration pathway is the Trinity River or its tributaries and neither is used as a drinking water supply. It is on this basis that the shallow ground water beneath the OU No. 3 sites are not considered to be a potential drinking water supply. Therefore, further evaluation of the ground water in the Risk Assessment and the Feasibility Study was not conducted and no action is recommended for the ground water associated with OU No. 3.

## **VI. SUMMARY OF SITE RISKS**

### **A. Risk Assessment Description**

An evaluation of the potential risks to human health and the environment from OU No. 3 contaminants was conducted as part of the baseline risk assessment. The risk assessment was conducted as part of the RI. The baseline risk assessment is an analysis of the potential adverse human health effects (both current and future) resulting from exposures of humans to hazardous substances present on OU No. 3. By definition, a baseline risk assessment evaluates risks that may exist under the no-action alternative (that is, in the absence of any remedial actions to control or mitigate releases). The baseline risk assessment provides the basis for taking the remedial action and indicates the exposure pathways that need to be addressed by the remedial action.

The Summary of Site Risks section of the ROD summarizes the results of the baseline risk assessment. Calculations and a more detailed analysis may be found in the baseline Human Health Risk Assessment and Ecological Risk Assessment reports for OU No. 3, contained in the Administrative Record for OU No. 3.

### **B. Human Health Risks**

The baseline risk assessment was divided into two parts: the human health evaluation and the ecological evaluation. The baseline risk assessment for the human health risks was based on Reasonable Maximum Exposure (RME). The human health evaluation considered all contaminated media, such as the surface and subsurface soils and surface water and sediments. The baseline risk assessment assumed that the reasonably anticipated future land use of OU No. 3, Site 1 would be residential, and Sites 3 and 4 would be industrial. The assumptions for Site 1 and 3 are based on the City of Dallas current zoning map (City of Dallas, 1992 - 1994). Although, Site 4 is currently zoned as residential, EPA, in coordination with TNRCC, is presently working with the City of Dallas to change the zoning to non-residential use. Therefore, the potential risk to the following populations most likely to be exposed at OU No. 3 were evaluated:

#### **Site 1**

- Current and future child and resident adults;

- Current and future child and adult trespasser;
- Current and future worker.

### Site 3

- Current and future child and adult trespasser.
- Current and future worker.

### Site 4

- Current and future child and adult trespasser;
- Current and future worker;
- Future child and resident adults (Jaycee Zaragoza Park only).

The risk assessment conducted at OU No. 3 of the RSR site was done in accordance with EPA guidance, specifically the Risk Assessment Guidance for Superfund: Volume I: Human Health Evaluation Manual (Part A) (Interim Final, EPA/540/1-89/002, December 1989). The major components of the baseline risk assessment are: identification of contaminants of concern, exposure assessment, toxicity assessment, and risk characterization. For purposes of the risk assessment, the risks are evaluated by exposure areas which are related to future land use considerations.

Highlights of the findings for the major components of the risk assessment for the site are summarized below.

### C. Identification of Chemicals of Potential Concern

The samples collected as part of the field investigation and analyzed through the Contract Laboratory Program (CLP) were used in the risk assessment to estimate risks to human receptors at OU No. 3. This includes data for soil, sediment, dust, and surface water. Ground water results were not used quantitatively in the risk assessment (see rationale in Section V. (Site Characteristics) L.5.). Not all data collected as part of the field investigation was used in the HHRA, such as the XRF data, which is used for screening.

Concentrations of metals detected in surface soil samples were compared to regional background soil concentrations. Metals were evaluated to determine potential chemicals of concern (COPCs) for use in the HHRA. The COPCs identified for Sites 1, 3 and 4 of OU No. 3 are listed in **Table 2**.

**Table 2**  
**Chemicals of Potential Concern**  
**RSR Corporation Superfund Site**  
**Operable Unit No. 3**

Page 1 of 4

Chemical Name	Site 1				Site 3				Site 4			
	Surface Soil	Subsurface Soil	Sediment	Surface Water	Surface Soil	Subsurface Soil	Sediment	Surface Water	Surface Soil	Subsurface Soil	Sediment	Surface Water
<b>Inorganics:</b>												
Antimony	X	X	X	X	X	X	X	X	X	X	X	X
Arsenic	X	X	X	X	X		X	X	X	X	X	X
Barium	X			X	X			X	X	X		X
Beryllium	X		X	X	X		X	X	X		X	X
Cadmium	X	X	X		X	X	X	X	X	X	X	
Chromium	X			X	X			X		X		X
Cobalt	X	X	X	X	X	X	X	X	X	X	X	X
Copper	X	X	X	X	X	X	X	X	X	X	X	X
Lead	X	X	X	X	X	X	X	X	X	X	X	X
Manganese	X	X	X	X	X	X	X	X	X	X	X	X
Mercury	X		X	X	X		X	X	X	X	X	X
Nickel	X	X	X	X	X	X	X	X	X	X	X	X
Selenium	X	X	X		X	X	X		X	X	X	X
Silver	X	X	X		X	X	X		X	X	X	
Thallium	X	X	X	X	X	X	X		X	X	X	
Vanadium				X				X				X
Zinc	X	X	X	X	X	X	X	X	X	X	X	X
<b>Organics:</b>												
Acenaphthene			X								X	
Acenaphthylene												
Acetone				X		X		X				
alpha-BHC				X				X			X	
Aldrin			X	X		X					X	
Alpha chlordane			X			X	X				X	
Anthracene			X								X	
Arochlor-1242						X		X				

**Table 2**  
**Chemicals of Potential Concern**  
**RSR Corporation Superfund Site**  
**Operable Unit No. 3**

Page 2 of 4

Chemical Name	Site 1				Site 3				Site 4			
	Surface Soil	Subsurface Soil	Sediment	Surface Water	Surface Soil	Subsurface Soil	Sediment	Surface Water	Surface Soil	Subsurface Soil	Sediment	Surface Water
Arochlor-1248							X					
Arochlor-1254					X		X					
Arochlor-1260			X						X	X	X	
Benzo(a)anthracene			X			X	X				X	
Benzo(a)pyrene			X			X					X	
Benzo(b)fluoranthene			X	X		X			X	X	X	
Benzo(g,h,i)perylene			X			X					X	
Benzo(k)fluoranthene			X	X							X	
beta-BHC				X							X	
Bis(2-chloroethyl)ether							X					
Bis(2-ethylhexyl)phthalate			X	X		X	X		X	X	X	
2-Butanone			X					X			X	
Butylbenzyl phthalate			X	X							X	
Carbazole			X								X	
Carbon disulfide			X									
Chlorobenzene												X
Chrysene			X	X		X	X				X	
4,4'- DDD			X			X	X					
4,4'- DDE			X			X	X				X	
4,4'- DDT			X	X		X	X				X	
delta-BHC			X					X				
Di-n-butyl-phthalate			X	X							X	X
Di-n-octyl-phthalate						X					X	
Dibenz(a,h)anthracene			X								X	
Dibenzofuran											X	
1,3-Dichlorobenzene				X				X				X

**Table 2**  
**Chemicals of Potential Concern**  
**RSR Corporation Superfund Site**  
**Operable Unit No. 3**

Page 3 of 4

Chemical Name	Site 1				Site 3				Site 4			
	Surface Soil	Subsurface Soil	Sediment	Surface Water	Surface Soil	Subsurface Soil	Sediment	Surface Water	Surface Soil	Subsurface Soil	Sediment	Surface Water
Dieldrin			X			X	X	X			X	
Diethylphthalate				X			X	X				
Dimethylphthalate			X					X				
Endosulfan I			X				X					
Endosulfan II				X								
Endosulfan sulfate			X			X					X	
Endrin							X					
Endrin aldehyde			X									
Endrin ketone			X			X					X	
Ethylbenzene			X									
Fluoranthene			X	X		X	X		X	X	X	
Fluorene			X			X					X	
gamma - BHC						X						
Gamma chlordanes			X			X	X	X			X	
Heptachlor			X									
Heptachlor epoxide	X	X	X				X	X			X	X
2-Hexanone			X					X				
Indeno(1,2,3-cd)pyrene			X								X	
Methoxychlor						X					X	
Methylene chloride						X		X				X
2-Methylnaphthalene			X				X	X				
4-Methyl-2-pentanone			X									
2-Methylphenol												X
Nitrobenzene											X	
N- Nitrosodiphenylamine			X									
Phenanthrene			X				X				X	
Phenol												

**Table 2**  
**Chemicals of Potential Concern**  
**RSR Corporation Superfund Site**  
**Operable Unit No. 3**

**Page 4 of 4**

Chemical Name	Site 1				Site 3				Site 4			
	Surface Soil	Subsurface Soil	Sediment	Surface Water	Surface Soil	Subsurface Soil	Sediment	Surface Water	Surface Soil	Subsurface Soil	Sediment	Surface Water
Pyrene			X	X		X	X		X	X	X	
Tetrachloroethene			X									
Toluene			X									
Trichloroethene									X	X		
Xylene, mixture			X									

#### D. Exposure Assessment

The objective of the exposure assessment is to estimate the type, magnitude, frequency, duration and route of exposure of the contaminants of concern. The contaminant sources, slag and battery chips and contaminated soils that contain the COPCs. The COPCs are released through physical/chemical processes that include, leaching, precipitation-induced runoff, wind entrainment or direct contact.

As discussed above, the shallow ground water in the area of Sites 1, 3 and 4 of OU No. 3 is not being used as a potable water supply, nor is it expected to be used as a water supply, therefore, ingestion of ground water is not considered a complete pathway for purposes of this risk assessment. Drinking water is provided by the City of Dallas through a series of surface water reservoirs. The nearest public supply well is about 3,750 feet east of the intersection of Westmoreland Road and Singleton Boulevard. This City of Dallas well is capped and no longer used as a public water supply. The well is approximately 2,540 feet deep.

The following exposure scenarios and pathways were quantitatively evaluated in the HHRA:

##### **Site 1**

- Current and future child and resident adults: incidental ingestion of soil, inhalation of fugitive dust, and dermal contact with soil.
- Current and future child and adult trespasser: incidental ingestion of soil, inhalation of fugitive dust, dermal contact with soil; dermal contact with surface water; and ingestion and dermal contact with sediment.
- Current and future worker: incidental ingestion of soil, inhalation of fugitive dust, and dermal contact with soil.

##### **Site 3**

- Current and future child and adult trespasser: incidental ingestion of soil, inhalation of fugitive dust, dermal contact with soil; dermal contact with surface water; and ingestion and dermal contact with sediment.

- Current and future worker: incidental ingestion of soil, inhalation of fugitive dust, and dermal contact with soil.

#### **Site 4**

- Current and future child and adult trespasser: incidental ingestion of soil, inhalation of fugitive dust, dermal contact with soil(landfills); dermal contact with surface water; and ingestion and dermal contact with sediment.
- Future worker: incidental ingestion of soil, inhalation of fugitive dust, and dermal contact with soil.
- Future child and resident adults (Jaycee Zaragoza Park only): incidental ingestion of soil, inhalation of fugitive dust, and dermal contact with soil.

Exposure scenarios were evaluated using standard EPA default exposure parameters for average (typical) and Reasonable Maximum Exposure (RME) conditions. RME is defined as the "highest exposure that is reasonably expected to occur at a site". The intent of the RME is to estimate a conservative exposure case. Residential, trespasser and worker exposure scenarios evaluated in the HHRA used standard EPA default exposure parameters for average (typical) and RME scenarios. These parameters are presented in **Tables 3, 4 and 5**.

#### Estimation of Lead Intake - Children

EPA's IEUBK model estimates blood-lead levels in children exposed to environmental sources of lead using site-specific data and/or default values in each medium. The IEUBK model integrates exposure to lead from air, drinking water, soil, dust, diet, and paint for each age group. The biokinetics section of the model uses monthly total lead uptake to estimate the amount of lead that occurs in a number of body compartments for each month. Age-specific mean blood lead levels are then computed by the model based on this six-compartment biokinetics model of tissue distribution and excretion of lead. The IEUBK model sums predicted uptakes over time and estimates the distribution of blood-lead levels in an exposed population. According to the Centers for Disease Control (CDC), 10 ug/dL is the blood-lead level of concern for children.

**Table 3**  
**Exposure Assumptions – Residential\***  
**RSR Corporation Superfund Site**  
**Operable Unit No. 3**

Exposure Parameter	Residential – Child (0-6)		Residential – Adult	
	Typical Exposure	Reasonable Maximum Exposure	Typical Exposure	Reasonable Maximum Exposure
Soil/Sediment Ingestion Rate (mg/day)	200	200	100	100
Inhalation Rate (m <sup>3</sup> /day)	5	5	20	20
Skin Surface Area (cm <sup>2</sup> )	1,800	1,800	5,000	5,000
Soil-to-Skin Adherence Factor (mg/cm <sup>2</sup> )	0.2	1	0.2	1
Exposure Frequency (days/year)	350	350	350	350
Exposure Duration (years)	2.2	6	9	30
Body Weight (kg)	15	15	70	70
Averaging Time – Noncancer (years)	2.2	6	9	30
Averaging Time – Cancer (years)	70	70	70	70
Source: *EPA, 1992a, unless otherwise noted.				

**Table 4**  
**Exposure Assumptions-Trespasser<sup>a</sup>**  
**RSR Corporation Superfund Site**  
**Operable Unit No. 3**

Exposure Parameter	Trespasser-Child (7-16)		Trespasser-Adult	
	Typical Exposure	Reasonable Maximum Exposure	Typical Exposure	Reasonable Maximum Exposure
Soil/Sediment Ingestion Rate (mg/day)	100	100	100	100
Inhalation Rate (m <sup>3</sup> /hour)	1 <sup>b</sup>	1 <sup>b</sup>	0.6 <sup>b</sup>	0.6 <sup>b</sup>
Skin Surface Area (cm <sup>2</sup> )	5000	5000	5000	5000
Soil-to-Skin Adherence Factor (mg/cm <sup>2</sup> )	0.2	1	0.2	1
Exposure Time (hours/day)	1 <sup>c</sup>	2 <sup>c</sup>	1 <sup>c</sup>	2 <sup>c</sup>
Exposure Frequency (days/year)	52	52	52	52
Exposure Duration (years)	10	10	10	10
Body Weight (kg)	43	43	70	70
Averaging Time-Noncancer (years)	10	10	10	10
Averaging Time-Cancer (years)	70	70	70	70

Source:

<sup>a</sup>EPA, 1992a, unless otherwise noted.

<sup>b</sup>EPA, 1989b. The inhalation rate corresponds to an average light activity rate for the age group.

<sup>c</sup>Based on professional judgement or site-specific factors.

**Table 5**  
**Exposure Assumptions- Worker<sup>a</sup>**  
**RSR Corporation Superfund Site**  
**Operable Unit No. 3**

Exposure Parameter	Current Occupational- Adult		Future Occupational- Adult	
	Typical Exposure	Reasonable Maximum Exposure	Typical Exposure	Reasonable Maximum Exposure
Soil/Sediment Ingestion Rate (mg/day)	50	50	50	50
Inhalation Rate (m <sup>3</sup> /hour)	2.5	2.5	2.5	2.5
Skin Surface Area (cm <sup>2</sup> )	5000	5000	5000	5000
Soil-to-Skin Adherence Factor (mg/cm <sup>2</sup> )	0.2	1	0.2	1
Exposure Time (hours/day)	1 <sup>b</sup>	2 <sup>b</sup>	8	8
Exposure Frequency (days/year)	52 <sup>b</sup>	52 <sup>b</sup>	250	250
Exposure Duration (years)	9	25	9	25
Body Weight (kg)	70	70	70	70
Averaging Time- Noncancer (years)	9	25	9	25
Averaging Time- Cancer (years)	70	70	70	70
Source: <sup>a</sup> EPA, 1992a, unless otherwise noted. <sup>b</sup> Based on professional judgement or site-specific factors.				

### Estimation of Lead Intake - Adults

At the present time, EPA does not have an approved model for estimating blood-lead levels in adults that are exposed to environmental sources of lead. Consequently, for this HHRA, lead exposure to adults (trespasser and commercial/industrial worker scenarios) was estimated using a screening-level model developed by Bowers *et al.* (1994). This model uses a biokinetics slope factor derived from the work of Pocock *et al.* (1983), who measured blood-lead levels in over 7,000 middle-aged men in 24 British towns to estimate blood-lead levels of adults exposed to environmental sources of lead. The study yielded a biokinetics slope factor of 0.375 micrograms/deciliter (mg/dL) blood-lead per mg/day lead uptake. Although there is no EPA guidance on the blood lead level that is considered appropriate for protecting adults, both EPA and the Center for Disease Control (CDC) recommend that there should be no more than a five (5) percent likelihood that a young child should have lead value greater than 10 ug/dL. Since exposed workers could include pregnant women, and because the fetus is exposed to lead levels nearly equal to those of the mother, the health criterion selected for use in this evaluation is that there should no more than a five (5) percent chance that the fetus of a pregnant woman would have a lead level above 10 ug/dL. The health goal is equivalent to specifying that the 95th percentile of the lead distribution in fetuses does not exceed 10 ug/dL.

### E. Toxicity Assessment

The toxicity assessment involves identifying the COPCs which may cause adverse health effects in exposed individuals. The toxicity assessment seeks to develop a reasonable appraisal of the associations between the degree of exposure to a chemical and the possibility of adverse health effects. Whether or not a toxic response occurs depends on the chemical and physical properties of the toxic agent, the degree of exposure to the agent, and the susceptibility of an individual to the particular effect. To characterize the toxicity of a particular chemical, the type of effect it can produce and how much is needed to produce that effect must be known.

For purposes of the risk assessment, health effects are divided into two categories; noncancer and cancer effects. Noncancer health effects include a variety of toxicological end points and may include effects on specific organs or systems, such as the kidney, liver, nervous system and lungs. There are two categories of noncancer health effects, acute or subchronic,

which are short-term, and chronic, which are long-term. Some chemical exposures that result in, or are suspected in, the development of cancer are referred to as carcinogens. EPA's carcinogen classification scheme, using a weight of evidence approach to determine the likelihood of a chemical's carcinogenic potential in humans, is described below.

Category	Meaning	Basis
A	Known human carcinogen	Sufficient evidence of increased cancer incidence in exposed humans.
B1	Probable human carcinogen	Sufficient evidence of increased cancer incidence in animals, with suggestive evidence from studies of exposed humans.
B2	Probable human carcinogen	Sufficient evidence of increased cancer incidence in animals, but lack of data or insufficient data from humans.
C	Possible human carcinogen	Suggestive evidence of carcinogenicity in animals.
D	Cannot be evaluated	No evidence or inadequate evidence of cancer in animals or humans.
E	Noncarcinogen	Evidence of noncarcinogenicity in humans.

Toxicity values are quantitative expressions of the dose-response relationship for a chemical and are expressed as cancer slope factors and noncancer reference doses, both of which are specific to the route of exposure. The toxicity value used to describe the dose-response relationship for noncancer health effects is the chronic reference doses (RfDs), which are expressed in terms of mg/kg-day. **Tables 6 & 7** lists the chronic RfDs for the chemicals of concern for the OU No. 3 sites. The dose-response relationship for cancer effects is expressed as a cancer slope factor (SF), which is the upper-bound estimate of the probability of a response per unit intake of a chemical over a lifetime. The SFs for the chemicals of concern at the OU No. 3 site are described in **Tables 8 & 9** and are expressed as the inverse of mg/kg-day.

**Table 6**  
**Toxicity Values–Noncancer Health Effects**  
**Inorganic COPCs**  
**RSR Corporation Superfund Site**  
**Operable Unit No. 3**

Chemical	Systemic Toxicity (mg/kg/day)				
	Critical Effect	Chronic Reference Dose (RfD)			
		Oral	Source	Inhalation <sup>(a)</sup>	Source
Aluminum	--	--		--	--
Antimony	Blood glucose, cholesterol	0.0004	IRIS	--	--
Arsenic	Keratosis, hyperpigmentation	0.0003	IRIS	--	--
Barium	Increased blood pressure	0.07	IRIS	0.00014	HEAST
Beryllium	Organ changes, decreased body weight	0.005	IRIS	--	--
Cadmium (food)	Proteinuria	0.001	IRIS	--	--
Cadmium (water)	Proteinuria	0.0005	IRIS	--	--
Chromium III	None observed	1	IRIS	--	--
Chromium VI	Increase in tissue chromium connection	0.005	IRIS	--	--
Cobalt	--	--	--	--	--
Copper	Gastrointestinal irritation	0.037	HEAST	--	--
Lead	--	<sup>(b)</sup>	--	--	--
Manganese (food)	CNS	0.14	IRIS	0.000014	IRIS
Manganese (water)	CNS	0.05	IRIS	0.000014	IRIS
Mercury	CNS, kidney	0.0003	HEAST	0.000086	HEAST
Nickel (soluble salts)	Decreased body/organ weight	0.02	IRIS	--	--
Selenium	Hair/nail loss, dermatitis	0.005	IRIS	--	--
Silver	Argyria	0.005	IRIS	--	--
Thallium <sup>(c)</sup>	Increased SGOT (liver), increased serum LDH (blood), alopecia (hair)	0.00008	IRIS	--	--
Vanadium	Renal	0.007	HEAST	--	--
Zinc	Anemia	0.3	IRIS	--	--

HEAST = Health Effects Assessment Summary Tables (1994c).

IRIS = Integrated Risk Information System (1995b).

-- = Information not available.

CNS = Central Nervous System.

<sup>(a)</sup> Derived from chronic inhalation reference concentration (RfC).

<sup>(b)</sup> EPA work group considered it inappropriate to develop an RfD for inorganic lead.

<sup>(c)</sup> Toxicity values correspond to thallium chloride.

**Table 7**  
**Toxicity Values--Noncancer Health Effects**  
**Organic COPCs**  
**RSR Corporation Superfund Site**  
**Operable Unit No. 3**

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Chemical	Systemic Toxicity (mg/kg/day)				
	Critical Effect	Oral	Source	Inhalation <sup>(a)</sup>	Source
Acenaphthene	Hepatotoxicity	0.06	IRIS	--	--
Acenaphthylene	--	--	--	--	--
Acetone	Increased liver and kidney weights; neprotoxicity	0.1	IRIS	--	--
Aldrin	Liver toxicity	0.00003	IRIS	--	--
Anthracene	No observed effects	0.3	IRIS	--	--
Arochlor 1016	Reduced birth weight	0.00007	IRIS(1/1/93)	--	--
Arochlor 1254	Ocular effects; distorted nail growth; immune system effects	0.00002	IRIS(1/1/94)	--	--
Benzene	--	--	--	--	--
Benzo(a)anthracene	--	--	--	--	--
Benzo(a)pyrene	--	--	--	--	--
Benzo(b)fluoranthene	--	--	--	--	--
Benzo(g,h,i)perylene	--	--	--	--	--
Benzo(k)fluoranthene	--	--	--	--	--
Bis(2-chloroethyl)ether	--	--	--	--	--
Bis(2-ethylhexyl)phthalate	Increased relative liver weight	0.02	IRIS	--	--
2-Butanone	Decreased fetal birth weight	0.6	IRIS(5/1/93)	0.285714286	IRIS
Butylbenzylphthalate	Significantly increased liver/body weight and liver/brain weight ratios	0.2	IRIS(1994)	--	--
Carbazole	--	--	--	--	--
Carbon disulfide	Fetal toxicity/malformations	0.1	IRIS	0.002857143	HEAST
Chlordane	Regional liver hypertrophy in females	0.00006	IRIS	--	--
Chlorobenzene	Histopathological changes in liver	0.02	IRIS	0.005714286	HEAST
Chrysene	--	--	--	--	--
4,4'-DDD	--	--	--	--	--
4,4'-DDE	--	--	--	--	--

**Table 7**  
**Toxicity Values--Noncancer Health Effects**  
**Organic COPCs**  
**RSR Corporation Superfund Site**  
**Operable Unit No. 3**

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Chemical	Systemic Toxicity (mg/kg/day)				
	Critical Effect	Oral	Source	Inhalation <sup>(a)</sup>	Source
4,4'-DDT	Liver lesions	0.0005	IRIS	--	--
Di-n-butyl phthalate	Increased mortality	0.1	IRIS	--	--
Di-n-octyl phthalate	Increased liver and kidney weights; increase enzymatic levels	0.02	HEAST	--	--
Dibenz(a,h)anthracene	--	--	--	--	--
Dibenzofuran	--	0.004	<sup>(b)</sup>	--	--
1,3-Dichlorobenzene	Renal and hepatic effects	0.089	DWHA(3/87)	--	--
1,4-Dichlorobenzene	Renal effects	0.1	DWHA(3/87)	0.228571429	IRIS(1/5/94)
Dieldrin	Liver lesions	0.00005	IRIS	--	--
Diethylphthalate	Decreased growth rate, food consumption, and altered organ weights	0.8	IRIS	--	--
Dimethylphthalate	Kidney effects	10	HEAST	--	--
Endosulfan	Weight gain; kidney and blood vessel effects	0.006	IRIS(1994)	--	--
Endrin	Mild liver lesions; convulsion	0.0003	IRIS	--	--
Ethylbenzene	Liver and kidney toxicity	0.1	IRIS	0.285714286	IRIS
Fluoranthene	Nephropathy; increased liver weights	0.04	IRIS	--	--
Fluorene	Decreased RBC	0.04	IRIS	--	--
Heptachlor	Liver weight increase in males	0.0005	IRIS	--	--
Heptachlor epoxide	Increased liver/body weight ratio	0.000013	IRIS	--	--
Indeno(1,2,3-cd)pyrene	--	--	--	--	--
Lindane	Liver and kidney toxicity	0.0003	IRIS	--	--
Methoxychlor	Excessive loss of litters	0.005	IRIS	--	--
4-Methyl-2-pentanone	Whole body and liver, kidney effects	0.05	HEAST	0.022857143	HEAST
Methylene chloride	Liver toxicity	0.06	IRIS	0.857142857	HEAST
2-Methylphenol	Decreased body weights and neurotoxicity	0.05	IRIS	--	--

**Table 7**  
**Toxicity Values--Noncancer Health Effects**  
**Organic COPCs**  
**RSR Corporation Superfund Site**  
**Operable Unit No. 3**

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Chemical	Systemic Toxicity (mg/kg/day)				
	Critical Effect	Oral	Source	Inhalation <sup>(a)</sup>	Source
4-methylphenol	CNS hyperactivity; respiratory distress	0.005	HEAST	--	--
Naphthalene	Decreased body weight gain	0.04	<sup>(c)</sup>	--	--
Nitrobenzene	Hematologic, adrenal, renal, and hepatic lesions	0.0005	IRIS	0.000571429	HEAST
N-Nitrosodiphenylamine	--	--	--	--	--
Phenanthrene	--	--	--	--	--
Polychlorinated biphenyls	--	--	--	--	--
Pyrene	Kidney effects	0.03	IRIS	--	--
1,1,2,2-Tetrachloroethane	--	--	--	--	--
Toluene	Liver and kidney weight changes	0.2	IRIS	0.114285714	IRIS
Trichloroethene	Liver toxicity	0.006	<sup>(d)</sup>	--	--
Xylene (mixture)	Hyperactivity; decreased male body weight; increased mortality	2	IRIS	--	--

IRIS = Integrated Risk Information System (1995 unless otherwise noted).  
HEAST = Health Effects Assessment Summary Tables (1994c)  
-- = Information not available  
CNS = Central nervous system  
RBC = Red blood cell  
<sup>(a)</sup> = Derived from chronic inhalation reference concentration (RfC)  
<sup>(b)</sup> = Provisional RfD; Oregon DEQ  
<sup>(c)</sup> = Provisional RfD; EPA Region V  
<sup>(d)</sup> = Provisional RfD; ECAO

**Table 8**  
**Toxicity Values- Cancer Health Effects**  
**Inorganic COPCs**  
**RSR Corporation Superfund Site**  
**Operable Unit No. 3**

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Chemical	Carcinogenic Potency (mg/kg/day) <sup>-1</sup>						
	Tumor Site	Weight of Evidence <sup>a</sup>	Source	Oral Slope Factor	Source	Inhalation Slope Factor <sup>b</sup>	Source
Aluminum	--	--	--	--	--	--	
Antimony	--	D	DWHA <sup>c</sup>	--	--	--	
Arsenic	Lung	A	IRIS	1.5	EPA	15	IRIS
Barium	--	D	DWHA <sup>d</sup>	--	--	--	--
Beryllium	Lung, Bone	B2	IRIS	4.3	IRIS	8.4	IRIS
Cadmium	Lung	B1	IRIS	--	--	6.3	IRIS
Chromium III		D	DWHA <sup>d</sup>	--	--	--	--
Chromium VI	Lung	A	IRIS	--	--	42	IRIS
Cobalt	--	--	--	--	--	--	--
Copper	--	D	IRIS	--	--	--	--
Lead	Kidney	B2	IRIS	--	--	--	--
Manganese	--	D	IRIS	--	--	--	--
Mercury	--	D	IRIS	--	--	--	--
Nickel (refinery dust)	Respiratory System	A	IRIS	--	--	0.84	IRIS
Selenium	--	D	IRIS	--	--	--	--
Silver	--	D	IRIS	--	--	--	--
Thallium	--	D	DWHA <sup>d</sup>	--	--	--	--

**Table 8**  
**Toxicity Values–Cancer Health Effects**  
**Inorganic COPCs**  
**RSR Corporation Superfund Site**  
**Operable Unit No. 3**

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Chemical	Carcinogenic Potency (mg/kg/day) <sup>-1</sup>						
	Tumor Site	Weight of Evidence <sup>a</sup>	Source	Oral Slope Factor	Source	Inhalation Slope Factor <sup>b</sup>	Source
Vanadium	--	--	--	--	--	--	--
Zinc	--	D	IRIS	--	--	--	--

HEAST = Health Effects Assessment Summary Tables, 1994c.

IRIS = Integrated Risk Information System, 1995

-- = Information not available.

<sup>a</sup>Weight of Evidence Groups: A is Human Carcinogen; B is Probable Human Carcinogen (B1-limited evidence of carcinogenicity in humans, B2-sufficient evidence of carcinogenicity in animals with inadequate or lack of evidence in humans); C is Possible human Carcinogen; D is Not Classifiable as to Human Carcinogenicity.

<sup>b</sup>Derived from unit risk factor assuming an inhalation rate of 20 m<sup>3</sup>/day and a 70 kg bodyweight.

<sup>c</sup>Drinking Water Health Advisory. USEPA Office of Drinking Water. April 1992.

<sup>d</sup>Drinking Water Health Advisory. USEPA Office of Drinking Water. January 1987.

**Table 9**  
**Toxicity Values--Cancer Health Effects**  
**Organic COPCs**  
**RSR Corporation Superfund Site**  
**Operable Unit No. 3**

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Chemical	Carcinogenic Potency (mg/kg-day) <sup>-1</sup>					
	Weight of Evidence	Source	Oral Slope Factor	Source	Inhalation Slope Factor	Source
Acenaphthene	NA	--	--	--	--	--
Acenaphthylene	D	IRIS	--	--	--	--
Acetone	D	IRIS	--	--	--	--
Aldrin	B2	IRIS	17	IRIS	17.15	Calc. from unit risk
Anthracene	D	IRIS	--	--	--	--
Arochlor 1016	NA	--	--	--	--	--
Arochlor 1254	NA	--	--	--	--	--
Benzene	A	IRIS	0.029	IRIS	0.02905	Calc. from unit risk
Benzo(a)anthracene	B2	IRIS	0.73	USEPA(7/93)	--	--
Benzo(a)pyrene	B2	IRIS	7.3	IRIS	--	--
Benzo(b)fluoranthene	B2	IRIS	0.73	USEPA(7/93)	--	--
Benzo(g,h,i)perylene	D	IRIS	--	--	--	--
Benzo(k)fluoranthene	B2	IRIS	0.73	USEPA(7/93)	--	--
Bis(2-chloroethyl)ether	B2	IRIS	1.1	IRIS	1.155	Calc. from unit risk
Bis(2-ethylhexyl)phthalate	B2	IRIS	0.014	IRIS	--	--
2-Butanone	D	IRIS	--	--	--	--
Butylbenzylphthalate	C	IRIS	--	--	--	--
Carbazole	B2	HEAST	0.02	HEAST	--	--

**Table 9**  
**Toxicity Values--Cancer Health Effects**  
**Organic COPCs**  
**RSR Corporation Superfund Site**  
**Operable Unit No. 3**

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Chemical	Carcinogenic Potency (mg/kg-day) <sup>-1</sup>					
	Weight of Evidence	Source	Oral Slope Factor	Source	Inhalation Slope Factor	Source
Carbon disulfide	NA	--	--	--	--	--
Chlordane	B2	IRIS	1.3	IRIS	1.295	Calc. from unit risk
Chlorobenzene	D	IRIS	--	--	--	--
Chrysene	B2	IRIS	0.0073	USEPA(7/93)	--	--
4,4'-DDD	B2	IRIS	0.24	IRIS	--	--
4,4'-DDE	B2	IRIS	0.34	IRIS	--	--
4,4'-DDT	B2	IRIS	0.34	IRIS	0.3395	Calc. from unit risk
Di-n-butyl phthalate	D	IRIS	--	--	--	--
Di-n-octyl phthalate	NA	--	--	--	--	--
Dibenz(a,h)anthracene	B2	IRIS	7.3	USEPA(7/93)	--	--
Dibenzofuran	D	IRIS	--	--	--	--
1,3-Dichlorobenzene	D	IRIS	--	--	--	--
1,4-Dichlorobenzene	B2	HEAST	0.024	HEAST	--	--
Dieldrin	B2	IRIS	16	IRIS	16.1	Calc. from unit risk
Diethylphthalate	D	IRIS	--	--	--	--
Dimethylphthalate	D	IRIS	--	--	--	--
Endosulfan	NA	--	--	--	--	--
Endrin	D	IRIS	--	--	--	--
Ethylbenzene	D	IRIS	--	--	--	--

**Table 9**  
**Toxicity Values--Cancer Health Effects**  
**Organic COPCs**  
**RSR Corporation Superfund Site**  
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Chemical	Carcinogenic Potency (mg/kg-day) <sup>-1</sup>					
	Weight of Evidence	Source	Oral Slope Factor	Source	Inhalation Slope Factor	Source
Fluoranthene	D	IRIS	--	--	--	--
Fluorene	D	IRIS	--	--	--	--
Heptachlor	B2	IRIS	4.5	IRIS	4.55	Calc. from unit risk
Heptachlor epoxide	B2	IRIS	9.1	IRIS	9.1	Calc. from unit risk
Indeno(1,2,3-cd)pyrene	B2	IRIS	0.73	USEPA(7/93)	--	--
Lindane	B2-C	HEAST	1.3	HEAST	--	--
Methoxychlor	D	IRIS	--	--	--	--
4-Methyl-2-pentanone	NA	--	--	--	--	--
Methylene chloride	B2	IRIS	0.0075	IRIS	0.001645	Calc. from unit risk
2-Methylphenol	C	IRIS	--	--	--	--
4-methylphenol	C	IRIS	--	--	--	--
Naphthalene	D	IRIS	--	--	--	--
Nitrobenzene	D	IRIS	--	--	--	--
N-Nitrosodiphenylamine	B2	IRIS	0.0049	IRIS	--	--
Phenanthrene	D	IRIS	--	--	--	--
Polychlorinated biphenyls	B2	IRIS	7.7	IRIS	--	--
Pyrene	D	IRIS	--	--	--	--
1,1,2,2-Tetrachloroethane	C	IRIS	0.2	IRIS	0.203	Calc. from unit risk
Toluene	D	IRIS	--	--	--	--

**Table 9**  
**Toxicity Values--Cancer Health Effects**  
**Organic COPCs**  
**RSR Corporation Superfund Site**  
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Chemical	Carcinogenic Potency (mg/kg-day) <sup>-1</sup>					
	Weight of Evidence	Source	Oral Slope Factor	Source	Inhalation Slope Factor	Source
Trichloroethene	B2	HEAST(1991)	0.011	HEAST(1991)	0.00595	Calc. from unit risk
Xylene (mixture)	D	IRIS	--	--	--	--
IRIS = Integrated Risk Information System (1995 unless otherwise noted). HEAST = Health Effects Assessment Summary Tables (1994c unless otherwise noted). -- = Information not available USEPA 1993= Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons						

## F. Human Health Risk Characterization

The risk of cancer from exposure to a chemical is described in terms of the probability that an individual exposed for his or her entire lifetime will develop cancer by age 70. For carcinogens, risks are estimated as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to the carcinogen. Excess lifetime cancer risk is calculated from the following equation:

$$\text{Risk} = \text{CDI} \times \text{SF}$$

where:

risk = a unitless probability (e.g.,  $2 \times 10^{-5}$ ) of an individual developing cancer;

CDI = chronic daily intake averaged over 70 years (mg/kg-day);  
and

SF = slope-factor, expressed as (mg/kg-day)<sup>-1</sup>

These risks are probabilities that are generally expressed in scientific notation (e.g.,  $1 \times 10^{-6}$ ). An excess lifetime cancer risk of  $1 \times 10^{-6}$  indicates that, as a reasonable maximum estimate, an individual has a 1 in 1,000,000 chance of developing cancer as a result of site-related exposure to a carcinogen over a 70-year lifetime under the specific exposure conditions at a site.

The potential for noncarcinogenic effects is evaluated by comparing an exposure level over a specified time period (e.g., lifetime) with a reference dose derived for a similar exposure period. The ratio of exposure to toxicity is called the hazard quotient. By adding the hazard quotients for all contaminants of concern which affect the same target organ (e.g., liver) within a medium or across all media to which a given population may reasonably be exposed, the Hazard Index (HI) can be generated.

The HQ is calculated as follows:

$$\text{Non-cancer HQ} = E/\text{RfD}$$

where:

E = Daily Intake (either chronic or sub-chronic)

RfD = reference dose; and

E and RfD are expressed in the same units and represent the same exposure period (e.g., chronic, subchronic, or short-term).

A summary of risks across all exposure pathways and exposure scenarios for each exposure area evaluated in the OU No. 3 risk assessment are included in **Tables 10, 11, 12, 13**. The results of the risk assessment generally indicate the following:

#### Site 1

- ◆ The additive estimated lifetime cancer risks for both current and future child and adult residents related to soil ingestion, inhalation of fugitive dust, and dermal contact fall within the  $10^{-3}$  and  $10^{-4}$  range. The hazard indices for current and future child resident and the future adult all exceeded one. The hazard index for the current adult exceeds one.
- ◆ The additive estimated excess lifetime cancer risks for both current and future trespassers (children and adults) from soil ingestion, inhalation of fugitive dust, and dermal contact are within the  $10^{-4}$  range. The hazard indices for the current and future child and adult trespassers all exceed one.
- ◆ For current and future workers at Site 1, the additive estimated excess lifetime cancer risks related to soil ingestion, inhalation of fugitive dust, and dermal contact with soil are within the  $10^{-4}$  range. The hazard indices for both the current and future worker exposure pathways all exceed one.

#### Site 3

- ◆ For current and future child and adult trespassers, the additive estimated excess lifetime cancer risks related to soil ingestion, inhalation of fugitive dust, and dermal contact are within the  $10^{-6}$  range. All of the hazard indices associated with the current and future child and adult trespasser exposure to soil are less than one.
- ◆ For current and future child and adult trespassers exposed to sediments in the drainages that traverse Site 3, the additive estimated excess lifetime cancer risks associated with ingestion and dermal contact are within the  $10^{-6}$  range. Comparable risks related to dermal contact with surface water are estimated to be in the  $10^{-7}$  to  $10^{-8}$  range. None of the hazard indices associated with exposure to surface water or sediments exceeded one.

**Table 10**  
**Site 1 Risk Summary Table**  
**RSR Corporation Superfund Site**  
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Pathway	Typical Lifetime Excess Cancer Risk	RME Lifetime Excess Cancer Risk	Risk Contribution	Typical Hazard Index	RME Hazard Index	Risk Contribution
<b>Soil</b>						
<b>Current Residential - Child</b>						
Inhalation	2E-05	6E-05	As-95%	1.1E+00	1.1E+00	Mn-94%
Ingestion	3E-03	8E-03	As-99%	3.9E+02	3.9E+02	As-57%; Sb-42%
Dermal	1E-09	1E-08		1.4E-01	6.8E-01	
<b>Total</b>	<b>3E-03</b>	<b>9E-03</b>		<b>3.9E+02</b>	<b>3.9E+02</b>	
<b>Soil</b>						
<b>Current Residential - Adult</b>						
Inhalation	7E-05	2E-04	As-95%	9.1E-01	9.1E-01	As-57%; Sb-42%
Ingestion	1E-03	5E-03	As-100%	4.1E+01	4.1E+01	
Dermal	2E-09	4E-08		8.1E-02	4.1E-01	
<b>Total</b>	<b>1E-03</b>	<b>5E-03</b>		<b>4.2E+01</b>	<b>4.3E+01</b>	
<b>Soil</b>						
<b>Current Trespasser - Child</b>						
Inhalation	1E-06	2E-06	As-100%	1.1E-02	2.2E-02	As-57%; Sb-42%
Ingestion	4E-04	4E-04		1.0E+01	1.0E+01	
Dermal	6E-10	3E-09		2.0E-02	9.8E-02	
<b>Total</b>	<b>4E-04</b>	<b>4E-04</b>		<b>1.0E+01</b>	<b>1.0E+01</b>	

**Table 10**  
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<b>Pathway</b>	<b>Typical Lifetime Excess Cancer Risk</b>	<b>RME Lifetime Excess Cancer Risk</b>	<b>Risk Contribution</b>	<b>Typical Hazard Index</b>	<b>RME Hazard Index</b>	<b>Risk Contribution</b>
<b>Soil Current Trespasser - Adult</b>						
Inhalation	4E-07	7E-07	As-100%	4.0E-03	8.1E-03	As-57%; Sb-42%
Ingestion	2E-04	2E-04		6.1E+00	6.1E+00	
Dermal	4E-10	2E-09		1.2E-02	6.0E-02	
<b>Total</b>	<b>2E-04</b>	<b>2E-04</b>		<b>6.2E+00</b>	<b>6.2E+00</b>	
<b>Soil Current Commercial/Industrial Worker</b>						
Inhalation	1E-06	7E-06	As-100%	1.7E-02	3.4E-02	As-57%; Sb-42%
Ingestion	1E-04	3E-04		3.1E+00	3.1E+00	
Dermal	4E-10	5E-09		1.2E-02	6.0E-02	
<b>Total</b>	<b>1E-04</b>	<b>3E-04</b>		<b>3.1E+00</b>	<b>3.2E+00</b>	

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Pathway	Typical Lifetime Excess Cancer Risk	RME Lifetime Excess Cancer Risk	Risk Contribution	Typical Hazard Index	RME Hazard Index	Risk Contribution
<b>Soil</b>						
<b>Future Residential - Child</b>						
Inhalation	1E-05	3E-05	As-93%	1.1E+00	1.1E+00	Mn-96%
Ingestion	2E-03	4E-03	As-100%	2.8E+02	2.8E+02	As-40%; Sb-58%
Dermal	1E-09	2E-08		7.8E-02	3.9E-01	
<b>Total</b>	<b>2E-03</b>	<b>4E-03</b>		<b>2.8E+02</b>	<b>2.8E+02</b>	
<b>Soil</b>						
<b>Future Residential - Adult</b>						
Inhalation	4E-05	1E-04	As-95%	9.5E-01	9.5E-01	As-40%; Sb-58%
Ingestion	7E-04	2E-03	As-100%	3.0E+01	3.0E+01	
Dermal	3E-09	5E-08		4.6E-02	2.3E-01	
<b>Total</b>	<b>7E-04</b>	<b>2E-03</b>		<b>3.1E+01</b>	<b>3.1E+01</b>	
<b>Soil</b>						
<b>Future Trespasser - Child</b>						
Inhalation	5E-07	1E-06	As-100%	1.1E-02	2.3E-02	As-40%; Sb-58%
Ingestion	2E-04	2E-04		7.2E+00	7.2E+00	
Dermal	9E-10	4E-09		1.1E-02	5.6E-02	
<b>Total</b>	<b>2E-04</b>	<b>2E-04</b>		<b>7.2E+00</b>	<b>7.2E+00</b>	

**Table 10**  
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Pathway	Typical Lifetime Excess Cancer Risk	RME Lifetime Excess Cancer Risk	Risk Contribution	Typical Hazard Index	RME Hazard Index	Risk Contribution
<b>Soil Future Trespasser - Adult</b>						
Inhalation	2E-07	4E-07	As-99%	4.2E-03	8.4E-03	As-40%; Sb-58%
Ingestion	1E-04	1E-04		4.4E+00	4.4E+00	
Dermal	5E-10	3E-09		6.9E-03	3.4E-02	
<b>Total</b>	<b>1E-04</b>	<b>1E-04</b>		<b>4.4E+00</b>	<b>4.4E+00</b>	
<b>Soil Future Commercial/Industrial Worker</b>						
Inhalation	3E-05	7E-05	As-92%	6.8E-01	6.8E-01	As-40%; Sb-58%
Ingestion	2E-04	7E-04	As-100%	1.1E+01	1.1E+01	
Dermal	2E-09	3E-08		3.3E-02	1.7E-01	
<b>Total</b>	<b>3E-04</b>	<b>8E-04</b>		<b>1.1E+01</b>	<b>1.1E+01</b>	

**Table 10**  
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Pathway	Typical Lifetime Excess Cancer Risk	RME Lifetime Excess Cancer Risk	Risk Contribution	Typical Hazard Index	RME Hazard Index	Risk Contribution
<b>Sediment Current/Future Trespasser - Adult</b>						
Inhalation	NA	NA	As-41%; BaP-30% BaP-55%; D(a,h)A-28%	NA	NA	
Ingestion	6E-06	6E-06		7.6E-02	7.6E-02	
Dermal	3E-06	2E-05		4.0E-03	2.0E-02	
<b>Total</b>	<b>1E-05</b>	<b>2E-05</b>		<b>8E-02</b>	<b>1E-01</b>	
<b>Sediment Current/Future Trespasser - Child</b>						
Inhalation	NA	NA	As-41%; BaP-30% BaP-55%; D(a,h)A-28%	NA	NA	
Ingestion	1E-05	1E-05		1.1E-01	1.1E-01	
Dermal	6E-06	3E-05		6.5E-03	3.2E-02	
<b>Total</b>	<b>2E-05</b>	<b>4E-05</b>		<b>1.1E-01</b>	<b>1.4E-01</b>	
<b>Surface Water Current/Future Trespasser - Adult</b>						
Inhalation	NA	NA	B(b)F-73%	NA	NA	
Ingestion	NA	NA		NA	NA	
Dermal	1E-06	3E-06		7.6E-03	1.5E-02	
<b>Total</b>	<b>1E-06</b>	<b>3E-06</b>		<b>7.6E-03</b>	<b>1.5E-02</b>	

**Table 10**  
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Pathway	Typical Lifetime Excess Cancer Risk	RME Lifetime Excess Cancer Risk	Risk Contribution	Typical Hazard Index	RME Hazard Index	Risk Contribution
<b>Surface Water Current/Future Trespasser - Child</b>						
Inhalation	NA	NA		NA	NA	
Ingestion	NA	NA		NA	NA	
Dermal	2E-06	5E-06	BaP-72%; As-26%	1.0E-02	2.5E-02	
<b>Total</b>	<b>2E-06</b>	<b>5E-06</b>		<b>1.0E-02</b>	<b>2.5E-02</b>	
As = Arsenic Sb = Antimony Mn = Manganese BaP = Benzo(a)pyrene D(a,h)A = Dibenz(a,h)Anthracene B(b)F = Benzo(b)Fluoranthene						

**Table 11**  
**Site 3 Risk Summary Table**  
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Pathway	Typical Lifetime Excess Cancer Risk	RME Lifetime Excess Cancer Risk	Risk Contribution	Typical Hazard Index	RME Hazard Index	Risk Contribution
<b>Soil</b>						
<b>Current Trespasser - Child</b>						
Inhalation	2E-08	5E-08	As-78%; Be-15%	3.0E-03	5.9E-03	
Ingestion	2E-06	2E-06		5.6E-02	5.6E-02	
Dermal	1E-07	5E-07		4.8E-03	2.4E-02	
<b>Total</b>	<b>2E-06</b>	<b>2E-06</b>		<b>6.4E-02</b>	<b>4.0E-02</b>	
<b>Soil</b>						
<b>Current Trespasser - Adult</b>						
Inhalation	8E-09	2E-08	As-78%; Be-15%	1.1E-03	2.2E-03	
Ingestion	1E-06	1E-06		3.4E-02	3.4E-02	
Dermal	6E-08	3E-07		2.9E-03	1.5E-02	
<b>Total</b>	<b>1E-06</b>	<b>1E-06</b>		<b>3.8E-02</b>	<b>5.0E-02</b>	
<b>Soil</b>						
<b>Current Commercial/Industrial Worker</b>						
Inhalation	3E-08	2E-07	As-78%; Be-15%	4.5E-03	9.1E-03	
Ingestion	4E-07	1E-06		1.7E-02	1.7E-02	
Dermal	6E-08	8E-07		2.9E-03	1.5E-02	
<b>Total</b>	<b>5E-07</b>	<b>2E-06</b>		<b>2.4E-02</b>	<b>4.1E-02</b>	
<b>Soil</b>						
<b>Future Trespasser - Child</b>						

**Table 11**  
**Site 3 Risk Summary Table**  
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Pathway	Typical Lifetime Excess Cancer Risk	RME Lifetime Excess Cancer Risk	Risk Contribution	Typical Hazard Index	RME Hazard Index	Risk Contribution
Inhalation	2E-08	4E-08	As-77%; Be-16%	2.9E-03	5.8E-03	
Ingestion	2E-06	2E-06		6E-02	6E+00	
Dermal	1E-07	5E-07		4.0E-03	2E-02	
<b>Total</b>	<b>2E-06</b>	<b>2E-06</b>		<b>7E-02</b>	<b>6E-00</b>	
<b>Soil Future Trespasser - Adult</b>						
Inhalation	8E-09	2E-08	As-77%; Be-15%	1.1E-03	2.2E-03	
Ingestion	9E-07	9E-07		3.7E-02	3.7E-02	
Dermal	7E-08	3E-07		2.4E-03	1.2E-02	
<b>Total</b>	<b>1E-06</b>	<b>1E-06</b>		<b>4.1E-02</b>	<b>5.1E-02</b>	

**Table 11**  
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Pathway	Typical Lifetime Excess Cancer Risk	RME Lifetime Excess Cancer Risk	Risk Contribution	Typical Hazard Index	RME Hazard Index	Risk Contribution
<b>Soil Future Commercial/Industrial Worker</b>						
Inhalation	1E-06	3E-06		1.7E-01	1.7E-01	
Ingestion	2E-06	6E-06		8.9E-02	8.9E-02	
Dermal	3E-07	4E-06		1.2E-02	5.8E-02	
<b>Total</b>	<b>3E-06</b>	<b>1E-05</b>		<b>2.7E-01</b>	<b>3.2E-01</b>	
<b>Sediment Current/Future Trespasser - Adult</b>						
Inhalation	NA	NA		NA	NA	
Ingestion	1E-06	1E-06		2.8E-02	2.8E-02	
Dermal	5E-08	2E-07		1.4E-03	7.1E-03	
<b>Total</b>	<b>1E-06</b>	<b>1E-06</b>		<b>2.9E-02</b>	<b>3.5E-02</b>	
<b>Sediment Current/Future Trespasser - Child</b>						
Inhalation	NA	NA		NA	NA	
Ingestion	2E-06	2E-06		4.5E-02	4.5E-02	
Dermal	8E-08	4E-07		2.3E-03	1.2E-02	
<b>Total</b>	<b>2E-06</b>	<b>2E-06</b>		<b>4.7E-02</b>	<b>5.7E-02</b>	

**Table 11**  
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<b>Pathway</b>	<b>Typical Lifetime Excess Cancer Risk</b>	<b>RME Lifetime Excess Cancer Risk</b>	<b>Risk Contribution</b>	<b>Typical Hazard Index</b>	<b>RME Hazard Index</b>	<b>Risk Contribution</b>
<b>Surface Water Current/Future Trespasser - Adult</b>						
Inhalation	NA	NA		NA	NA	
Ingestion	NA	NA		NA	NA	
Dermal	4E-08	9E-08		9.3E-04	1.9E-03	
<b>Total</b>	<b>4E-08</b>	<b>9E-08</b>		<b>9.3E-02</b>	<b>1.9E-03</b>	
<b>Surface Water Current/Future Trespasser - Child</b>						
Inhalation	NA	NA		NA	NA	
Ingestion	NA	NA		NA	NA	
Dermal	7E-08	1E-07		1.5E-03	3E-03	
<b>Total</b>	<b>7E-08</b>	<b>1E-07</b>		<b>1.5E-03</b>	<b>3E-03</b>	

**Table 12**  
**Site 4 Risk Summary Table**  
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Pathway	Typical Lifetime Excess Cancer Risk	RME Lifetime Excess Cancer Risk	Risk Contribution	Typical Hazard Index	RME Hazard Index	Risk Contribution
<b>Soil</b>						
<b>Current Resident - Child</b>						
Inhalation	4E-07	1E-06	Cr-77%; As-20%	2.8E-01	2.8E-01	As-50%; Sb-22%
Ingestion	1E-05	4E-05	As-85%; Be-14%	1.6E+00	1.6E+00	
Dermal	3E-08	4E-07		5.3E-03	2.7E-02	
<b>Total</b>	<b>1E-05</b>	<b>4E-05</b>		<b>2E+00</b>	<b>2E+00</b>	
<b>Soil</b>						
<b>Current Resident - Adult</b>						
Inhalation	1E-06	4E-06	Cr-77%; As-20%	2.4E-01	2.4E-01	
Ingestion	6E-06	2E-05	As-85%; Be-14%	1.7E-01	1.7E-01	
Dermal	7E-08	1E-06	PCB-74%; B(b)F-25%	3.2E-03	1.6E-02	
<b>Total</b>	<b>7E-06</b>	<b>3E-05</b>		<b>4E-01</b>	<b>4E-01</b>	
<b>Soil</b>						
<b>Current Trespasser - Child</b>						
Inhalation	2E-08	4E-08	As-85%; Be-14%	2.9E-03	5.9E-03	
Ingestion	2E-06	2E-06		4.0E-02	4.8E-02	
Dermal	2E-08	1E-07		7.6E-04	3.8E-03	
<b>Total</b>	<b>2E-06</b>	<b>2E-06</b>		<b>4E-02</b>	<b>5E-02</b>	
<b>Soil</b>						
<b>Current Trespasser - Adult</b>						

**Table 12**  
**Site 4 Risk Summary Table**  
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Pathway	Typical Lifetime Excess Cancer Risk	RME Lifetime Excess Cancer Risk	Risk Contribution	Typical Hazard Index	RME Hazard Index	Risk Contribution
Inhalation	7E-09	1E-08	As-85%; Be-14%	1.1E-03	2.2E-03	
Ingestion	1E-06	1E-06		2.6E-02	2.6E-02	
Dermal	1E-08	6E-08		4.7E-04	2.3E-03	
<b>Total</b>	<b>1E-06</b>	<b>1E-06</b>		<b>3E-02</b>	<b>3E-02</b>	
<b>Soil Future Trespasser - Child</b>						
Inhalation	2E-08	5E-08	As-86%; Be-13%	3.0E-03	6.1E-03	
Ingestion	2E-06	2E-06		5E-02	5E-02	
Dermal	2E-08	1E-07		8.1E-04	4.0E-03	
<b>Total</b>	<b>2E-06</b>	<b>2E-06</b>		<b>5E-02</b>	<b>6E-02</b>	
<b>Soil Future Trespasser - Adult</b>						
Inhalation	8E-09	2E-08	As-86%; Be-13%	1.1E-03	2.2E-03	
Ingestion	1E-06	1E-06		3.0E-02	3.0E-02	
Dermal	1E-08	6E-08		5.0E-04	2.5E-03	
<b>Total</b>	<b>1E-06</b>	<b>1E-06</b>		<b>3E-02</b>	<b>3E-02</b>	
<b>Soil Future Commercial/Industrial Worker</b>						

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Pathway	Typical Lifetime Excess Cancer Risk	RME Lifetime Excess Cancer Risk	Risk Contribution	Typical Hazard Index	RME Hazard Index	Risk Contribution
Inhalation	1E-06	3E-06	Cr-80%; As-17%	1.8E-01	1.8E-01	
Ingestion	2E-06	7E-06	As-86%; Be-13%	7.4E-02	7.4E-02	
Dermal	5E-08	7E-07		2.4E-03	1.2E-02	
<b>Total</b>	<b>4E-06</b>	<b>1E-05</b>		<b>3E-01</b>	<b>3E-01</b>	
<b>Sediment Current/Future Trespasser - Child</b>						
Inhalation	NA	NA		NA	NA	
Ingestion	3E-06	3E-06	As-52%; Be-16%	3.8E-02	3.8E-02	
Dermal	9E-07	4E-06	BaP-52%; D(a,h)A- 26%	1.9E-03	9.2E-03	
<b>Total</b>	<b>4E-06</b>	<b>7E-06</b>		<b>4E-02</b>	<b>5E-02</b>	

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Site 4 Risk Summary Table  
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Pathway	Typical Lifetime Excess Cancer Risk	RME Lifetime Excess Cancer Risk	Risk Contribution	Typical Hazard Index	RME Hazard Index	Risk Contribution
<b>Sediment Current/Future Trespasser - Adult</b>						
Inhalation	NA	NA	As 52%; Be-16% BaP-52%; D(a,h)A- 26%	NA	NA	
Ingestion	2E-06	2E-06		2.3E-02	2.3E-02	
Dermal	5E-07	3E-06		1.1E-03	5.7E-03	
<b>Total</b>	<b>2E-06</b>	<b>4E-06</b>		<b>2E-02</b>	<b>3E-02</b>	
<b>Surface Water Current/Future Trespasser - Child</b>						
Inhalation	NA	NA	As-100%	NA	NA	
Ingestion	NA	NA		NA	NA	
Dermal	6E-07	1E-06		1.2E-02	2.4E-02	
<b>Total</b>	<b>6E-07</b>	<b>1E-06</b>		<b>1E-02</b>	<b>2E-02</b>	

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Pathway	Typical Lifetime Excess Cancer Risk	RME Lifetime Excess Cancer Risk	Risk Contribution	Typical Hazard Index	RME Hazard Index	Risk Contribution
<b>Surface Water Current/Future Trespasser - Adult</b>						
Inhalation	NA	NA		NA	NA	
Ingestion	NA	NA		NA	NA	
Dermal	4E-07	8E-07		7.3E-03	1.5E-02	
<b>Total</b>	<b>4E-07</b>	<b>8E-07</b>		<b>7E-03</b>	<b>2E-02</b>	
As = Arsenic Be = Beryllium Cr = Chromium Sb = Antimony PCB = Polychlorinated biphenyl BaP = Benzo(a)pyrene B(b)F = Benzo(b)fluoranthene D(a,h)A = Dibenzo(a,h)Anthracene						

Table 13  
Site 4 - Jaycee Zaragoza Park Risk Summary Table  
RSR Corporation Superfund Site  
Operable Unit No. 3

Pathway	Typical Lifetime Excess Cancer Risk	RME Lifetime Excess Cancer Risk	Risk Contribution	Typical Hazard Index	RME Hazard Index	Risk Contribution
<b>Soil</b>						
<b>Current Residential - Child</b>						
Inhalation	3E-07	9E-07	As-89%; Be-11%	3.4E-01	3.4E-01	As-47%; Sb-35%
Ingestion	2E-05	4E-05		2.1E+00	2.1E+00	
Dermal	NA	NA		1.4E-03	7.1E-03	
<b>Total</b>	<b>2E-05</b>	<b>4E-05</b>		<b>2E+00</b>	<b>2E+00</b>	
<b>Soil</b>						
<b>Current Residential - Adult</b>						
Inhalation	1E-06	4E-06	Cr-71%; As-26% As-89%; Be-11%	2.9E-01	2.9E-01	
Ingestion	7E-06	2E-05		2.2E-01	2.2E-01	
Dermal	NA	NA		8.5E-04	4.3E-03	
<b>Total</b>	<b>8E-06</b>	<b>3E-05</b>		<b>5.1E-01</b>	<b>5.1E-01</b>	
<b>Surface Water</b>						
<b>Current/Future Trespasser - Child</b>						
Inhalation	NA	NA		NA	NA	
Ingestion	NA	NA		NA	NA	
Dermal	7E-09	1E-08		1.2E-04	2.4E-04	
<b>Total</b>	<b>7E-09</b>	<b>1E-08</b>		<b>1.2E-04</b>	<b>2.4E-04</b>	
As = Arsenic Be = Beryllium Cr = Chromium Sb = Antimony						

- ◆ For current workers, the additive estimated excess lifetime cancer risk related to soil ingestion, inhalation of fugitive dust, and dermal contact range from  $10^{-6}$  to  $10^{-7}$  for the RME and typical exposure setting. For future workers at Site 3, the comparable risks are about  $10^{-5}$  to  $10^{-6}$ . The hazard indices for both current and future worker exposure are all less than one.
- ◆ Like Site 1, the highest estimated risk associated with exposures assumed to occur on Site 3 are due to arsenic.

#### Site 4 Exclusive of Jaycee Zaragoza Park

- ◆ For the current and future child and adult trespasser within the defined exposure area, the additive estimated excess lifetime cancer risks associated with soil ingestion, inhalation of fugitive dust, and dermal contact fall within the  $10^{-6}$  range. None of the hazard indices for this scenario exceeded one.
- ◆ For the current and future child and adult trespassers, the additive estimated excess lifetime cancer risks related to sediment ingestion and dermal contact and dermal contact with water, all are within the  $10^{-6}$  to  $10^{-7}$  range. None of the hazard indices associated with these pathways exceeded one.
- ◆ For future workers, the additive estimated excess lifetime cancer risk due to soil ingestion, inhalation of fugitive dust, and dermal contact are within the  $10^{-5}$  to  $10^{-6}$  (RME and typical, respectively). The corresponding hazard indices are less than one.
- ◆ As for Sites 1 and 3, arsenic is the primary contributor to risk at this portion of Site 4. However, organic compounds including PCBs, and benzopyrene also contribute to dermal risk estimates for soil exposure.

#### Site 4 Jaycee Zaragoza Park

- ◆ For current adult and child residents, the additive estimated excess lifetime cancer risks associated with soil ingestion and inhalation of fugitive dust are within the  $10^{-5}$  to  $10^{-6}$  range (RME and typical). The hazard indices for current resident children exposed to soil exceed one; the hazard indices for the current adult residents are less than one. Arsenic and antimony in surface soil are the primary contributors leading to the hazard index greater than one for the current resident child.

- ◆ For the current and future child trespasser exposed to surface water in storm sewers within the exposure area, the estimated excess lifetime cancer risk associated with dermal contact are in the  $10^{-8}$  to  $10^{-9}$  range. None of the hazard indices exceed one.

#### Exposure to Lead

Risk from exposure to lead in soil for the sites in OU No. 3 was evaluated for children in Sites 1 and 4 (Jaycee Zaragoza Park) and adult workers in Sites 3 and 4 (landfill areas). The IEUBK model was used to estimate child exposure to lead. The adult-lead exposure was evaluated using the Bowers model with default input parameters provided by EPA Region 8.

#### Child Lead Exposure

**Table 14** summarizes the estimated blood-Pb concentrations that could result based on exposure to soil at Sites 1 and 4 under current and future conditions. The input parameters to the IEUBK model were combined with site-specific soil-lead levels to estimate values presented in **Table 14**. Results indicate that for Site 1 under either current or future use conditions, exposure to lead in soil yields predicted blood-PB distributions where more than five (5) percent of the exposed population of children ages zero to seven (7) could exhibit a blood-lead concentration greater than 10 ug/dL.

#### Adult Lead Exposure

For adult exposure to lead, the data collected for each Site where adult workers were identified as receptors were compared to a risk-based lead concentration developed using the Bowers model. Unlike the IEUBK model which predicts a blood-lead distribution, the EPA-revised version of the Bowers model estimates the soil-lead concentration for a worker population where no more than 5 percent exhibit a blood-lead greater than 10 ug/dL. The corresponding geometric soil-lead level is roughly 2,000 mg/kg. Several of the soil (surface and subsurface) samples on Sites 1, 3 and 4 exceeded the 2,000 mg/kg level.

**Table 14  
IEUBK Model Results**

<b>Site</b>	<b>Media</b>	<b>Average Soil-Pb (mg/kg)</b>	<b>Predicted Geometric Mean Blood-Pb (µg/dL)</b>	<b>Percent of Population &gt; 10 µg/dL</b>
1 Current	Surface soil	11,112	42.5	99.79
1 Future	Surface and Subsurface soil	10,286	40.7	99.79
4 Current and Future <sup>a</sup>	Jaycee Zaragoza Park Surface soil	408	4.0	2.25
<p>Notes: Model default values are presented in Table 4-7. Air concentration = 0.055 ug/m<sup>3</sup>. Multi-source dust model assumes 45% soil/55% dust. Mother's blood-Pb at birth is assumed to be 2.5 µg/dL.</p> <p><sup>a</sup>Site-specific model inputs measured as part of the RSR Site OU No. 1 (Subarea 3) RI were used in lieu of default parameters. Site-specific input values included a dust-to-soil ratio of 21 percent and a water concentration of 3.0 µg/L. The dust-to-soil ratio was estimated based on all in-home sampling for OU No. 1; the water concentration was based on the average concentration for homes in Subarea 3.</p>				

## G. Uncertainties Associated with Human Health Risk Calculations

Uncertainty in the risk assessment is a function of both the "state-of-the-practice" of risk assessment in general, and the uncertainty specific to the level of understanding of the RSR Corporation Superfund site. The risk assessment is subject to uncertainty from a variety of sources including the following:

- ◆ Sampling, analysis and data validation
- ◆ Fate and transport estimation
- ◆ Exposure estimation
- ◆ Toxicological data
- ◆ Blood-lead model

**Table 15** summarizes the general and site-specific uncertainties in the risk assessment.

## H. Ecological Risks

An ecological risk assessment (ERA) was also conducted for OU No. 3 to quantitatively determine the actual or potential effects to plants and animals on-site. The ERA was conducted as a part of the RI in order to evaluate if the COPCs from the slag piles/landfills pose a risk to the environment in the absence of remedial action. A summary is provided in the following paragraphs. For a full description of the ERA, refer to the ERA report, which can be found in the Administrative Record for OU No. 3.

OU No. 3 includes three sites that contain both terrestrial and aquatic habitat areas. In general terrestrial habitats for all sites are disturbed in many areas by historical and/or ongoing human activity. The majority of the aquatic areas are intermittent and can be dry several months of every year. Many of the drainages are fed by stormwater runoff. To determine exposure and risk conditions to aquatic receptors, an evaluation of surface water and sediment COPC occurrence was conducted. Ground water and storm sewer media were not evaluated because it was determined that aquatic receptors would be minimally exposed to these media.

A preliminary site investigation was conducted to determine the occurring ecological receptor populations. The predominant populations were comprised of opportunistic mammals (i.e. rats, deer mice and house mice) and opportunistic aquatic species (fathead minnows, mosquito fish and crayfish). A quantitative assessment was conducted for the assessment of exposure and risk

**Table 15**  
**Uncertainties Associated With Human Health Risk Estimations**  
**RSR Corporation Superfund Site**  
**Operable Unit No. 3**

**Page 1 of 2**

<b>Uncertainty Factor</b>	<b>Effects of Uncertainty</b>	<b>Comment</b>
<b>I. Exposure Assessment</b>		
Exposure assumptions	May under- or overestimate risk	Assumptions regarding media intake, population characteristics, and exposure patterns may not characterize exposures.
Use of applied dose to estimate risks	May over- or underestimate risks	Assumes that the absorption of the chemical is the same as it was in the study that derived the toxicity value. Assumes that absorption is equivalent across species (animal to humans). Absorption may vary with age and species.
Population characteristics	May over- or underestimate risks	Assumes weight, lifespan, ingestion rate, etc., are potentially representative for a potentially exposed population.
Intake	May underestimate risks	Assumes all intake of COPC is from the exposure medium being evaluated (no relative source contribution).
<b>II. Toxicity Assessment</b>		
Slope factor	May overestimate risks	Slope factors are upper 95th percent confidence limits derived from a linearized model. Considered unlikely to underestimate risk.
Toxicity values derived from animal studies	May over- or underestimate risks	Extrapolation from animal to humans may induce error because of differences in pharmacokinetics, target organs, and population variability.
Toxicity values derived primarily from high doses; most exposures are at low doses	May over- or underestimate risks	Assumes linear at low doses. Tends to have conservative exposure assumptions.

**Table 15**  
**Uncertainties Associated With Human Health Risk Estimations**  
**RSR Corporation Superfund Site**  
**Operable Unit No. 3**

**Page 2 of 2**

<b>Uncertainty Factor</b>	<b>Effects of Uncertainty</b>	<b>Comment</b>
<b>II. Toxicity Assessment (Continued)</b>		
Toxicity values	May over- or underestimate risks	Not all values represent the same degree of certainty. All are subject to change as new evidence becomes available.
Toxicity values derived from homogeneous animal populations	May over- or underestimate risks	Human populations may have a wide range of sensitivities to a chemical.
Not all chemicals at the site have toxicity values	May underestimate risk	These chemicals are not addressed quantitatively.
<b>III. Risk Estimation</b>		
Estimation of risks across exposure routes	May under- or overestimate risk	Some exposure routes have greater uncertainty associated with their risk estimates than others.
Cancer risk estimates--no threshold assumed	May overestimate risks	Possibility that some thresholds do exist.
Cancer risk estimate--low dose linearity	May overestimate risks	Response at low doses is not known.
Adult lead exposure quantified using Bowers, et al. (1994)	May under- or overestimate risk	Model used has not been formally adopted for use by EPA to assess adult lead exposure. Until the model is validated, the results should be viewed as uncertain.

to these on-site resident organisms. This approach entailed the evaluation of site exposure conditions by comparison of exposure point concentrations to literature-derived toxicity values (for the terrestrial assessment) or ambient water quality criteria and sediment toxicity benchmarks (for the aquatic assessment).

Inorganic COPCs were selected by comparison to regional background data for soils and sediment. Because there were no appropriate background concentrations for surface water, this step was not used for surface water COPC determination. All detected organic COPCs (in all media) were retained for analysis within the ERA.

An evaluation of surface water and sediment exposure and risk to aquatic life was conducted. In addition, an evaluation of surface water and surface soil exposure and risk to terrestrial life was conducted. Exposure of aquatic and terrestrial receptors to ground water and storm sewer media was not evaluated due to the high uncertainty of these exposure pathways. For the determination of aquatic risk, the surface water and sediment exposure point concentration was compared directly to ambient water quality criteria and sediment toxicity benchmark values, respectively. Both the acute and chronic ambient water quality criteria were used for comparison to COPC surface water concentrations to develop a range of hazard quotients within the risk characterizations. Similarly, a range of sediment hazard quotients also were used to bracket the range of risk attributable to aquatic life exposure. An evaluation of surface water and surface soil exposure and risk to terrestrial life was conducted by comparison of the surface water exposure point concentrations to literature-derived wildlife benchmark values, and by comparison of a calculated exposure dose for ingested soil and contaminated food to diet benchmark values. Observed surface water COPC and calculated diet concentrations were compared to literature-derived, no observed adverse effect levels (NOAELs) and lowest observed adverse effect levels (LOAEL) to determine risk.

Risk was quantified using the hazard quotient method. If the resulting quotient was greater than one (1), the analyte was considered to contribute to potential ecological risk. Results for the evaluation of COPC risk to aquatic and terrestrial life were as follows:

#### **Site 1**

- The presence of manganese in surface water is of concern due to the potential threat to aquatic life.

- The presence of lead in sediment is concern due to potential threat to aquatic life.
- The presence of antimony, arsenic and lead in soil is of concern due to the potential threat to deer mice.
- The presence of antimony, arsenic, lead, and copper, and zinc in soil is of concern due to the potential threat to terrestrial plants.

### **Site 3**

- The presence of lead and manganese in surface water is of concern due to the potential threat to aquatic life.
- The presence of lead in sediment is of concern due to its potential threat to aquatic life.
- The presence of arsenic and lead in soils are of concern due to their potential threat to deer mice, while the presence of lead is also of concern due to its potential threat to terrestrial plants.

### **Site 4**

- The presence of barium and manganese in surface water is of concern due to the potential threat to aquatic life.
- The presence of manganese in sediment is of concern due to the potential threat to aquatic life.

It should be noted that the assessment of risk to terrestrial organisms was highly conservative. Terrestrial animals in general receive the majority of their dietary water from food sources, not from water bodies. In addition, the majority of the drainages within OU No. 3 are intermittent, and would therefore create an exposure pathway only during precipitation events. In general, the possible risks to aquatic and terrestrial receptors are minimal. The literature-derived benchmarks provided only preliminary values for the determination of possible ecological risk. Development of ecological cleanup criteria was not conducted as part of the ERA.

## **I. Risk Assessment Conclusions**

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action

selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

## **VII. REMEDIAL ACTION GOALS**

This section presents the Remedial Action Objectives (RAOs), the associated Remedial Action Goals or Cleanup Levels for OU No. 3. The first step in developing remedial alternatives is to develop RAOs, which are based on the risk assessment and the ARARs analysis.

As discussed in the Section VI. SUMMARY OF SITE RISKS, the arsenic contributed most significantly to the carcinogenic and non-carcinogenic risk at the site and antimony contributed to the noncarcinogenic risk. Furthermore, lead concentrations are present above calculated acceptable levels based on the lead exposure evaluation done in the risk assessment.

The remedial action objectives for OU No. 3 of the RSR site are to minimize exposure to the lead, arsenic, and antimony present in the slag piles/landfills (Sites 1, 3 and 4) by direct contact, inhalation and ingestion, and to reduce the potential for migration of these contaminants. In order to meet these remedial objectives, remedial action goals for lead, arsenic, antimony have been established. For the purposes of this document, the remedial action goals are the same as action levels. These action levels are used as a "trigger" to initiate an action. The remedial action goals are outlined below and again as cleanup goals in the Selected Remedy Section of this document.

### **Remedial Action Goals or Cleanup levels:**

#### Site 1

Eliminate the potential for incidental ingestion, and/or dermal contact with contaminated soils or sediments with arsenic in excess of 20 ppm, and/or lead in excess of 500 ppm by on-site and off-site receptors.

#### Site 3

Eliminate the potential for incidental ingestion, and/or dermal contact with contaminated soils or sediments with arsenic in excess of 32.7 ppm , and/or lead in excess of 2,000 ppm by on-site and off-site receptors.

#### Site 4 (excluding Jaycee Park)

Eliminate the potential for incidental ingestion, and/or dermal contact with contaminated soils or sediments with arsenic in excess of 32.7 ppm , and/or lead in excess of 2,000 ppm by on-site and off-site receptors.

#### Site 4 - Jaycee Park

Eliminate the potential for incidental ingestion, and/or dermal contact with contaminated soils with arsenic in excess of 20 ppm, 108 ppm of antimony and/or lead in excess of 500 ppm by on-site and off-site receptors.

For Site 1, the RME lifetime excess cancer risk could be as much as  $9 \times 10^{-3}$  and the HI is 390 for the future child residential scenario (the most conservative scenario evaluated for Site 1). The Remedial Action Goals for Site 1, of 20 ppm of arsenic and 500 ppm of lead are based on residential risk based calculations.

For Site 3, the RME lifetime excess cancer risk could be as much as  $1 \times 10^{-5}$  and the HI is less than 1.0 for the future worker scenario (the most conservative scenario evaluated for Site 3). The Remedial Action Goals for Site 3, are 32.7 ppm of arsenic and 2,000 ppm of lead and are based on the future worker exposure. The 32.7 ppm action level for arsenic is based on the  $1 \times 10^{-5}$  risk (Sites 3 and 4) , since the  $1 \times 10^{-6}$  level corresponds to a level lower than background. The 2,000 ppm cleanup goal for lead is based on an Adult Lead Model that uses the geometric mean value for lead to predict blood-lead levels in exposed workers.

For Site 4 (excluding Jaycee Park), the RME lifetime cancer risk could be as much as  $1 \times 10^{-5}$  and the HI is less than 1.0 for the future worker exposure scenario (the most conservative scenario evaluated for Site 4). The Remedial Action Goals for Site 4(excluding Jaycee Park) of 32.7 ppm of arsenic and 2,000 ppm of lead are based on the future worker exposure (same basis as Site 3).

For Jaycee Park, the RME lifetime cancer risk could be as much as  $4 \times 10^{-5}$  and the HI is 2.0 for the child residential exposure scenario (the most conservative scenario evaluated for Jaycee Park). The Remedial Action Goals for Jaycee Park of 20 ppm of arsenic and 500 ppm of lead and 108 ppm of antimony are based on residential risk based calculations. A cleanup goal for antimony is included because antimony is a contributor (greater than 20 percent) to noncarcinogenic risk in Jaycee Park. The 108 ppm

action level for antimony is based on reducing the Hazard Index to less than one.

By addressing the contamination associated with the slag piles/landfills associated with Sites 1, 3 and 4 of OU No. 3 site specific risks described in Section VI. will be reduced or eliminated.

As stated previously, regardless of any site-related contamination, the shallow ground water in the vicinity of OU No. 3 is not considered as a potential water supply due to its overall low yield and slightly saline quality and the availability of the City of Dallas water supply, as well as potable supply permitting requirements. The expected migration pathway of the shallow ground water is the Trinity River or its tributaries and neither are used as a drinking water supply within 3 miles. It is on this basis that the shallow ground water beneath OU No. 3 is not considered to be a potential drinking water supply (i.e. a Class III aquifer) and no action is recommended for the shallow ground water beneath OU No. 3.

#### **VIII. DESCRIPTION OF ALTERNATIVES**

A Feasibility Study was conducted to develop and evaluate remedial alternatives for OU No. 3 of the RSR site. This report is included in the Administrative Record for OU No. 3. Remedial alternatives were assembled from applicable technologies/process options and were evaluated for effectiveness, implementability, and cost based on best professional judgement. The alternatives selected for detailed analysis were compared to the nine criteria required by the NCP. As required by the NCP, the no action alternative was also evaluated to serve as a point of comparison for the other alternatives.

Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably controlled and that present a significant risk to human health or the environment should exposure occur. There are no principal threats at OU No. 3 of the RSR site.

Low level threats are those source materials that generally can be reliably managed with little likelihood of migration and present a low risk in the event of exposure. The low level threats present at Sites 1, 3 and 4 are the contaminated material (i.e. battery chips, slag and soil) in the slag piles/landfills. The management expectations of low level threats are engineering controls, such as containment (40 CFR Section 300.430(a)(1)(iii)).

The alternatives developed for the three OU No. 3 sites generally involve containment alternatives.

The presumptive remedy approach was also used to streamline the evaluation of alternatives in the Feasibility Study for OU No. 3. Containment technologies are the presumed remedy for municipal landfills (i.e. Sites 3 and 4) because the volume of waste and the heterogeneity of the waste generally make treatment impracticable. The components of the presumptive remedy for landfills generally are:

- Landfill cap
- Leachate collection/treatment
- Ground water controls
- Landfill gas collection and treatment
- Institutional controls to supplement engineering controls

The EPA *Guidance on Presumptive Remedy for CERCLA Municipal Landfill Sites* states that the universe of alternatives that will be analyzed in detail may be limited to components of containment described above.

The remedial action goals or cleanup levels set forth above in Section VII., are the concentration levels below which contaminated media can be left on-site and managed for a future residential use (Site 1 and Jaycee Park) or industrial land use (Sites 3 and 4). The remedial alternatives described herein address the contamination associated with the slag piles/landfills present in Sites 1, 3 and 4 of OU No. 3.

As stated in Section VII. Remedial Action Goals, the shallow ground water in the vicinity of OU No. 3 is not considered as a potential water supply due to its overall low yield and slightly saline quality and the availability of the City of Dallas water supply, as well as potable supply permitting requirements. The expected migration pathway of the shallow ground water is the Trinity River or its tributaries and neither are used as a drinking water supply within 3 miles. It is on this basis that the shallow ground water beneath OU No. 3 is not considered to be a potential drinking water supply (i.e. a Class III aquifer). Therefore, the shallow ground water beneath OU No. 3 is not considered in any of the alternatives described below, and no action is recommended for the shallow ground water.

#### 1. Remedial Action Alternatives

The remedial action alternatives for OU No. 3 of RSR site are

presented below for each of the three sites followed by a description of the common elements of each alternative.

**Sites 1, 3 and 4**

<b>Alternative 1a:</b>	No Action
<b>Alternative 1b:</b>	Institutional Controls; Monitoring

**Site 1**

<b>Alternative 2:</b>	Removal; Offsite Disposal; Monitoring
<b>Alternative 3:</b>	Protective Cap; Removal; Monitoring
<b>Alternative 4:</b>	Composite Cap; Removal; Monitoring

**Site 3**

<b>Alternative 2:</b>	Removal; Monitoring
<b>Alternative 3:</b>	Protective Cap; Monitoring

**Site 4**

<b>Alternative 2:</b>	Removal; Monitoring
<b>Alternative 3:</b>	Protective Cap; Removal; Monitoring
<b>Alternative 4:</b>	Composite Cap; Removal; Monitoring

**2. Common Elements**

All of the alternatives for Site 1, with the exception of Alternative 1a, have the following common elements: (1) all general requirements associated with site preparation, such as contractor mobilization and demobilization, bonds and insurance, decontamination facilities, a health and safety program, (2) for Alternatives 1b, 3 and 4, annual monitoring for a 5 year period of two surface water locations; and (3) deed notices and restrictions.

All of the alternatives for Site 3, with the exception of Alternative 1a, have the following common elements: (1) all general requirements associated with site preparation, such as contractor mobilization and demobilization, bonds and insurance, decontamination facilities, a health and safety program, (2) annual monitoring for a 5 year period of four (4) existing ground water monitoring wells and four (4) surface water locations; (3) deed notices and restrictions.

All of the alternatives for Site 4, with the exception of Alternative 1a, have the following common elements: (1) all general requirements associated with site preparation, such as contractor mobilization and demobilization, bonds and insurance, decontamination facilities, a health and safety program, (2) annual monitoring for a 5 year period of three (3) existing ground water monitoring wells and two (2) surface water locations; (3) deed notices and restrictions.

All costs and implementation times are estimates. The costs have a degree of accuracy of +50% to -30% pursuant to the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA - Interim Final, OSWER Directive 9955.3-01, October 1988.

A brief description of the alternatives evaluated to address the contaminated media on the three OU No. 3 of the RSR site follows.

### **SITES 1, 3 and 4**

#### **Alternative 1a - No Action**

##### Major Components of Alternative 1a:

Evaluation of the No Action alternative is required by the NCP, 40 C.F.R. § 300.430(e)(3)(ii)(6), and is used as a baseline against which other alternatives are evaluated. Under this alternative, no remedial action would be undertaken to treat, contain, or remove contaminated media at Sites 1, 3 and 4 of OU No. 3. No institutional or operational controls would be implemented to restrict access to the OU No. 3 sites or to restrict exposure to contaminants. Monitoring would not be a component of this alternative. Under the No Action alternative contaminated material would be left in place in an uncontrolled state and potentially endanger human health and the environment.

##### Treatment Components:

There are no treatment components under Alternative 1a.

Containment Components:

There are no containment components under Alternative 1a.

General Components:

There is no time needed to implement Alternative 1a, since no remedial action is undertaken. And the costs are provided below:

Capital Costs:	\$0
Annual Operation &	
Maintenance:	\$0
Present Worth:	\$0

**SITE 1**

**Alternative 1b - Institutional Controls and Monitoring**

Major Components of Alternative 1b:

This alternative includes taking steps to have deed notices or a land use restriction placed in the deed records of the Site 1, OU No. 3 properties to warn potential buyers and lenders of the presence of contamination. Such deed notices and land use restrictions may be difficult to obtain and enforce and may meet with substantial opposition from many different sources. In addition, this alternative includes the repair of approximately 1,000 linear feet of fencing and the posting of warning signs and annual short-term monitoring of two (2) surface water locations.

Treatment Components:

There are no treatment components for the contaminated media under this Alternative 1b.

Containment Components:

There are also no containment components under Alternative 1b.

General Components:

The estimated time needed to implement Alternative 1b, is less than 1 year. The estimated costs for implementation of this alternative are provided below:

Capital Costs:	\$ 99,040
Annual Operation &	
Maintenance:	\$ 2,580
Present Worth:	\$ 110,210

## **Alternative 2 - Removal; Off-site Disposal; Monitoring**

### Major Components of Alternative 2:

This alternative involves selective removal of (1) slag piles, surficial slag deposits and battery casing chips, and related metals contaminated soils and sediments (exceeding cleanup goals) to a depth of two feet; (2) large slag pieces found in open concrete drainage channel; and (3) all tire piles and drums from the intermittent creek bed. The concrete and limestone debris piles located in the central portion of Site 1 would also be excavated and regraded. If slag and battery chips are unearthed in this area, they would be removed and disposed accordingly. Excavated material would be sampled and analyzed for hazardous characteristics (TCLP) prior to off-site disposal in an appropriate landfill. Excavations would be backfilled and regraded using conventional equipment and clean soil. Monitoring would be same as that described for Alternative 1b.

### Treatment Components:

Excavated contaminated material, such as soil or slag piles/deposits, that is determined to be hazardous (i.e. exceed TCLP requirements) would be treated accordingly, such as through stabilization/solidification, prior to disposal.

### Containment Components:

There is no containment component of Alternative 2 for Site 1.

### General Components:

The estimated time needed to implement Alternative 2 for Site 1, is less than 1 year. The estimated costs for implementation of this alternative are provided below:

Capital Costs:	\$ 1,503,490
Annual Operation & Maintenance:	\$ 2,580
Present Worth:	\$ 1,514,660

## **Alternative 3 - Protective Cap; Removal; and Monitoring.**

### Major Components of Alternative 3:

This containment alternative includes placing a protective soil cap over the exposed battery chips, slag, and metals-contaminated soils within the fenced area on Site 1. This 102,300 square foot area is currently covered with heavy vegetation, debris piles and an irregular slope leading to the intermittent creek. The cover/capping design plan would address surface preparation, such as clearing and regrading the hillside to a uniform slope.

It was assumed that a protective cover consisting of a 24-inch protective/topsoil cover would be placed on the regraded slope. The cap would be vegetated with native grasses and maintained for a period of 30 years. Sediments exceeding cleanup goals would be excavated, sampled for TCLP and disposed off-site accordingly. Monitoring would be the same as that for Alternative 1b, with the addition of an annual inspection of the cap.

Treatment Components:

Excavated sediments that are determined to be hazardous (i.e. exceed TCLP requirements) would be treated appropriately, such as through stabilization/solidification, prior to disposal.

Containment Components:

The containment component of Alternative 3 for Site 1 involves the placement of a protective cover, consisting of a 24-inch protective/topsoil cover, as described above, over the regraded slope.

General Components:

The estimated time needed to implement Alternative 3 for Site 1, is less than 1 year. The estimated costs for implementation of this alternative are provided below:

Capital Costs:	\$ 671,880
Annual Operation & Maintenance:	\$ 3,530
Present Worth:	\$ 726,140

**Alternative 4 - Composite Cap; Removal; and Monitoring**

Major Components of Alternative 4

This containment alternative is similar to Alternative 3, except that a composite barrier cap would be constructed over the 102,300 square foot area of concern on Site 1. Among the capping options, a composite barrier cap would provide maximum protection from exposure due to direct contact and is very effective for reducing infiltration. It was assumed that the composite cover would include a coarse base grade; a heavyweight nonwoven geotextile; 24 inches of compacted clay; a flexible membrane liner (FML); a drainage layer; a lightweight geotextile; and a 24 inch protective/topsoil cover. The cap would then be vegetated with appropriate native grasses and maintained for a period of 30 years. Sediments exceeding cleanup goals would be excavated, sampled for TCLP and disposed off-site accordingly. Monitoring would be the same as that for Alternative 1b, with the addition of an annual inspection of the cap.

Treatment Components:

The treatment components for Site 1 of Alternative 4 are identical to those in Alternative 3.

Containment Components:

The containment component of Alternative 4 for Site 1 involves the placement of a composite cover, as described above, over the regraded slope.

General Components:

The estimated time needed to implement Alternative 4, is less than 1 year. The estimated costs for implementation of this alternative are provided below:

Capital Costs:	\$ 1,161,670
Annual Operation & Maintenance:	\$ 3,530
Present Worth:	\$ 1,215,930

**SITE 3**

**Alternative 1b - Institutional Controls**

Major Components of Alternative 1b:

This alternative includes taking steps to have deed notices or a land use restriction placed in the deed records of the Site 3, OU No. 3 properties to warn potential buyers and lenders of the presence of contamination. Such deed notices and land use restrictions may be difficult to obtain and enforce and may meet with substantial opposition from many different sources. In addition, this alternative includes the placement of approximately 4,500 linear feet of fencing along the eastern and southern boundaries of the TXI and West Davis landfills, the placement of 3,200 linear feet of boundary fencing along the western boundary of the TXI and West Davis landfills and the posting of warning signs. A short-term (5 year) monitoring program for the ground water and the surface water on Site 3 would also be conducted. At the five (5) year review, the monitoring program could be discontinued, continued or modified as appropriate. For cost estimating purposes, it was assumed that monitoring would be conducted for a period of five (5) years.

Treatment Components:

There are no treatment components for the contaminated media for Site 3 under this Alternative 1b.

Containment Components:

There are also no containment components for Site 3 under Alternative 1b.

General Components:

The estimated time needed to implement Alternative 1b for Site 3, is less than 1 year. The estimated costs for implementation of this alternative are provided below:

Capital Costs:	\$ 344,350
Annual Operation & Maintenance:	\$ 6,530
Present Worth:	\$ 372,620

**Alternative 2 - Removal; Monitoring**

Major Components of Alternative 2:

Under this alternative surficial slag deposits and battery chips and related metals contaminated soils to a depth of two feet would be excavated from locations where cleanup goals are exceeded. Based on the RI findings and for cost estimating purposes it was assumed that 166,500 square feet (or 6,165 cubic feet) of contaminated material would be removed. Excavated material would be sampled and analyzed for hazardous characteristics (TCLP) prior to off-site disposal in an appropriate landfill. Excavations would be backfilled and regraded using conventional equipment and clean soil. Monitoring would be the same as that described for Alternative 1b.

Treatment Components:

Excavated contaminated material, such as soil or slag piles/deposits, that is determined to be hazardous (i.e. exceed TCLP requirements) would be treated appropriately, such as through stabilization/solidification, prior to disposal.

Containment Components:

There is no containment component of Alternative 2 for Site 3.

General Components:

The estimated time needed to implement Alternative 2 for Site 3 is less than 1 year. The estimated costs for implementation of this alternative are provided below:

Capital Costs:	\$ 1,620,810
Annual Operation & Maintenance:	\$ 6,540
Present Worth:	\$ 1,649,120

### **Alternative 3 - Protective Cap and Monitoring.**

#### Major Components of Alternative 3:

This containment alternative includes placing a protective soil cap over the southern portion of the West Davis landfill where there is exposed slag and battery chips and soil exceeding cleanup goals and isolated areas in the northern cell of the West Davis landfill. It is assumed that an area of approximately 275,900 square feet would be cleared and regraded prior to the installation of the cover. It was assumed the protective cover would consist of a 24-inch protective/topsoil cover and be vegetated with native grasses and maintained for a period of 30 years. Monitoring would be the same as that for Alternative 1b, with the addition of an annual inspection of the cap.

#### Treatment Components:

There is no treatment component of Alternative 3 for Site 3.

#### Containment Components:

The containment component of Alternative 3 for Site 3 involves the placement of a protective cover, consisting of a 24-inch protective/topsoil cover, as described above.

#### General Components:

The estimated time needed to implement Alternative 3 for Site 3 is less than 1 year. The estimated costs for implementation of this alternative are provided below:

Capital Costs:	\$ 1,174,610
Annual Operation & Maintenance:	\$ 4,490
Present Worth:	\$ 1,244,630

### **SITE 4**

### **Alternative 1b - Institutional Controls**

#### Major Components of Alternative 1b:

This alternative includes taking steps to have deed notices or a land use restriction placed in the deed records of the Site 4, OU No. 3 properties to warn potential buyers and lenders of the presence of contamination. Such deed notices and land use restrictions may be difficult to obtain and enforce and may meet with substantial opposition from many different sources. In addition, this alternative includes the placement of (1) approximately 4,100 linear feet of fencing along the southern and western perimeter of the West Dallas, Nomas, and Vilbig

landfills, (2) 1,350 linear feet of boundary fencing along the northwestern perimeter, and (3) the posting of warning signs. A short-term (5 year) monitoring program for the ground water and the surface water on Site 4 would also be conducted. At the five (5) year review, the monitoring program could discontinued, continued or modified as appropriate. For cost estimating purposes, it was assumed that monitoring would be conducted for a period of five (5) years.

Treatment Components:

There are no treatment components for the contaminated media for Site 4 under this Alternative 1b.

Containment Components:

There are also no containment components for Site 4 under Alternative 1b.

General Components:

The estimated time needed to implement Alternative 1b for Site 4 is less than 1 year. The estimated costs for implementation of this alternative are provided below:

Capital Costs:	\$ 311,260
Annual Operation & Maintenance:	\$ 4,230
Present Worth:	\$ 329,570

**Alternative 2 - Removal; Monitoring**

Major Components of Alternative 2:

Under this alternative surficial slag deposits and battery chips and related metals contaminated soils to a depth of two feet would be excavated from the West Dallas and Nomas landfills and Jaycee Park at locations where cleanup goals are exceeded. Based on the RI findings and for cost estimating purposes it was assumed that 706,270 square feet of contaminated material would be removed. Excavated material would be sampled and analyzed for hazardous characteristics (TCLP) prior to off-site disposal in an appropriate landfill. Excavations would be backfilled and regraded using conventional equipment and clean soil. Monitoring would be same as that described for Alternative 1b.

Treatment Components:

Excavated contaminated material, such as soil or slag piles/deposits, that is determined to be hazardous (i.e. exceed

TCLP requirements) would be be treated appropriately, such as through stabilization/solidification, prior to disposal.

Containment Components:

There is no containment component of Alternative 2 for Site 4.

General Components:

The estimated time needed to implement Alternative 2 for Site 4, is less than 1 year. The estimated costs for implementation of this alternative are provided below:

Capital Costs:	\$ 5,958,810
Annual Operation & Maintenance:	\$ 4,230
Present Worth:	\$ 5,977,120

**Alternative 3 - Protective Cap; Removal and Monitoring.**

Major Components of Alternative 3:

This containment alternative includes placing a protective soil cap over those areas within the Nomas and West Dallas landfills with exposed exposed slag and battery chips and metals-contaminated soil exceeding cleanup goals. Also included under this alternative are isolated areas in Jaycee Park where cleanup goals are exceeded. It is assumed that an approximate 904,300 square feet of the Nomas and West Dallas landfill would be cleared and regraded prior to the installation of the cover. It was assumed that the protective cover would consist of a 24-inch clay protective/topsoil and be vegetated with native grasses and maintained for a period of 30 years. Monitoring would be the same as that for Alternative 1b, with the addition of an annual inspection of the cap.

Treatment Components:

There is no treatment component of Alternative 3 for Site 3.

Containment Components:

The containment component of Alternative 3 for Site 3 involves the placement of a protective cover, consisting of a 24-inch protective/topsoil cover, as described above.

General Components:

The estimated time needed to implement Alternative 3 for Site 3 is less than 1 year. The estimated costs for implementation of this alternative are provided below:

Capital Costs:	\$ 3,528,600
Annual Operation & Maintenance:	\$ 3,970
Present Worth:	\$ 3,589,630

#### **Alternative 4 - Composite Cap; Removal; and Monitoring**

##### Major Components of Alternative 4

This containment alternative is similar to Alternative 3, except that a composite barrier cap would be constructed over the approximate 904,300 square feet area of the Nomas and West Dallas landfills. Among the capping options, a composite barrier cap would provide maximum protection from exposure due to direct contact and is very effective for reducing infiltration. It was assumed that the composite cover would include a coarse base grade; a heavyweight nonwoven geotextile; 24 inches of compacted clay; a flexible membrane liner (FML); a drainage layer; a lightweight geotextile; and a 24 inch protective/topsoil cover. Because landfill gas may build up below the barrier components, this alternative includes a minimal passive gas venting system. The cap would then be vegetated with appropriate native grasses and maintained for a period of 30 years. Monitoring would be the same as that for Alternative 1b, with the addition of an annual inspection of the cap.

##### Treatment Components:

There are no treatment components for Alternative 4 for Site 4.

##### Containment Components:

The containment component of Alternative 4 for Site 4 involves the placement of a composite cover, as described above, over portions of the Nomas and West Dallas landfills.

##### General Components:

The estimated time needed to implement Alternative 4, is less than 1 year. The estimated costs for implementation of this alternative are provided below:

Capital Costs:	\$ 8,273,880
Annual Operation & Maintenance:	\$ 5,910
Present Worth:	\$ 8,364,730

## IX.

### SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

The EPA uses nine criteria to evaluate alternatives for addressing a Superfund site. These nine criteria are specified in the NCP, 40 C.F.R. § 300.430(e)(9) and (f)(1). The criteria are categorized into three groups: threshold, primary balancing, and modifying. The threshold criteria must be met in order for an alternative to be eligible for selection. The primary balancing criteria are used to weigh major tradeoffs among alternatives. The modifying criteria are taken into account after state and public comments are received on a Proposed Plan.

#### **Nine Criteria**

The nine criteria that EPA uses in evaluating the remedial alternatives are as follows:

##### **Threshold Criteria**

Overall Protection of Human Health and the Environment addresses the way in which an alternative would reduce, eliminate, or control the risks posed by the site to human health and the environment. The methods used to achieve an adequate level of protection vary but may include treatment and engineering controls. Total elimination of risk is often impossible to achieve. However, a remedy must minimize risks to assure that human health and the environment are protected.

Compliance with "applicable or relevant and appropriate requirements (ARARs)" assures that an alternative will meet all related Federal, State, and local requirements.

##### **Balancing Criteria**

Long-term Effectiveness and Permanence addresses the ability of an alternative to reliably provide long-term protection for human health and the environment after the remediation goals have been accomplished.

Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment assesses how effectively an alternative will address the contamination at a site. Factors considered include the nature of the treatment process; the amount of hazardous materials that will be destroyed by the treatment process; how effectively the process reduces the toxicity, mobility, or volume of waste; and the type and quantity of contamination that will remain after treatment.

Short-term Effectiveness addresses the time it takes for remedy implementation. Remedies often require several years for implementation. A potential remedy is evaluated for the length of time required for implementation and the potential impact on human health and the environment during implementation.

Implementability addresses the ease with which an alternative can be accomplished. Factors such as availability of materials and services are considered.

Cost (including capital costs and projected long-term operation and maintenance costs) is considered and compared to the benefit that will result from implementing the alternative.

### **Modifying Criteria**

State Acceptance allows the state where the site is located to review the proposed plan and offer comments to the EPA. A state may agree with, oppose, or have no comment on the proposed remedy.

Community Acceptance allows for a public comment period for interested persons or organizations to comment on the proposed remedy. EPA considers these comments in making its final remedy selection. EPA addresses the public comments in a Responsiveness Summary, which is included as part of the ROD.

### **Comparative Analysis**

**Tables 16, 17 & 18** provide for a comparative analysis of seven of the NCP criteria, for Site 1, Site 3 and Site 4, respectively, against the respective remedial alternatives for each site. The seven NCP criteria evaluated in **Tables 16, 17 & 18**, include (1) Overall Protection of Human Health and the Environment, (2) Compliance with ARARs, (3) Long-Term Effectiveness and Permanence, (4) Reduction of Toxicity, Mobility, or Volume through Treatment, (5) Short-Term effectiveness, (6) Implementability and (7) Cost. The remaining two (2) criteria, State Acceptance and Community Acceptance are discussed below. The discussion applies to the entire OU No. 3 site.

### **State Acceptance**

The TNRCC has reviewed copies of the RI, Risk Assessment, FS and this Record of Decision and has provided technical support on all EPA efforts at OU No. 3. The TNRCC on behalf of the State of Texas concurs with EPA's selected remedial action for the Slag Piles/Landfills, OU No. 3, of the RSR site.

**Table 16**  
**Detailed Analysis of Alternatives - Site 1, OU No. 3**  
**RSR Corporation Superfund Site**

<b>Evaluation Criteria</b>	<b>Alternative 1a: No Action</b>	<b>Alternative 1b: Institutional Controls and Monitoring</b>	<b>Alternative 2: Removal and Monitoring</b>	<b>Alternative 3: Protective Cap, Removal, and Monitoring</b>	<b>Alternative 4: Composite Cap, Removal, and Monitoring</b>
Overall Protection of Human Health and the Environment	Not protective of human health and the environment. This alternative will not reduce the community and environmental exposure to contaminated materials. Does not achieve RAOs for soils, sediments, or surface water.	Not protective of human health and the environment. This alternative will not reduce environmental exposure to contaminated materials and only marginally reduces the community exposure. The trespasser exposure is not reduced. Does not achieve RAOs for soils, sediments, or surface water.	This alternative is protective of human health and the environment. RAOs are met for soils, sediments, and surface water.	This alternative is protective of human health and the environment. RAOs are met for soils, sediments, and surface water.	This alternative is protective of human health and the environment. RAOs are met for soils, sediments, and surface water.
Compliance with ARARs	This alternative does not comply with ARARs identified for OU No. 3. Specifically, RCRA characteristic wastes will remain in an uncontrolled state and RCRA requirements (30 T.A.C. § 335.8) for closure and remediation will not be met.	This alternative does not comply with ARARs identified for OU No. 3. Specifically, RCRA characteristic wastes will remain in an uncontrolled state and RCRA requirements (30 T.A.C. § 335.8) for closure and remediation will not be met.	This alternative complies with ARARs. Specifically, RCRA closure and remediation requirements (30 T.A.C. § 335.8).  RCRA handling, transportation, treatment, and disposal requirements (30 T.A.C. § 335.11, § 335.91, § 335.111 and § 335.112) will be met.  By managing soils, battery chips, and slag, storm runoff and surface water quality will improve to help meet the intent of 40 CFR Parts 120 and 125.	This alternative complies with ARARs. Specifically, RCRA closure and remediation requirements (30 T.A.C. § 335.8).  RCRA handling, transportation, treatment, and disposal requirements (30 T.A.C. § 335.11, § 335.91, § 335.111 and § 335.112) will be met.  By managing soils, battery chips, and slag, storm runoff and surface water quality will improve to help meet the intent of 40 CFR Parts 120 and 125.	This alternative complies with ARARs. Specifically, RCRA closure and remediation requirements (30 T.A.C. § 335.8).  RCRA handling, transportation, treatment, and disposal requirements (30 T.A.C. § 335.11, § 335.91, § 335.111 and § 335.112) will be met.  By managing soils, battery chips, and slag, and sediments, storm runoff and surface water quality will improve to help meet the intent of 40 CFR Parts 120 and 125.
Long-Term Effectiveness and Permanence	Long-term effectiveness and permanence is not achieved. No removal of contaminated media from the Site.	Long-term effectiveness and permanence is not achieved. No removal of contaminated media from the Site.	Long-term effectiveness and permanence achieved by this alternative by removing soils, battery chips, and slag exceeding target cleanup levels.	Moderate long-term effectiveness and permanence achieved by this alternative by capping soil, battery chip, and slag. The cap is not permanent and requires long-term monitoring and maintenance.	Moderate long-term effectiveness and permanence achieved by this alternative by removing sediments and capping soil, battery chip, and slag. The cap is not permanent and requires long-term monitoring and maintenance.
Reduction of Toxicity, Mobility, or Volume through Treatment	No reduction in toxicity, mobility, or volume of contaminated media.	No reduction in toxicity, mobility, or volume of contaminated media.	Containment but no reduction in mobility for wastes stabilized in RCRA Subtitle C landfill. No reduction of toxicity or volume.	Containment but no reduction of mobility of metals-contaminated soils, battery chips, and slag through containment. No reduction in toxicity or volume.	Containment but no reduction of mobility of metals-contaminated soils, battery chips, slag, and sediments through containment. No reduction in toxicity or volume.
Short-Term Effectiveness	Short-term effectiveness not achieved. No removal of contaminated media from the Site.	Short-term effectiveness not achieved. No removal of contaminated media from the Site.	Short-term risk to the community may increase during implementation. Dust control measures will be implemented during excavation. Heavy vehicular traffic may cause some nuisance to the community. There is potential for worker exposure during excavation. All appropriate regulations and safety measures will be instituted and strictly enforced.	Short-term risk is minimal in this alternative. Heavy vehicular traffic may cause some nuisance to the community during cap construction.	Short-term risk is minimal in this alternative. Heavy vehicular traffic may cause some nuisance to the community during cap construction and sediment removal.
Implementability	Implementable.	Monitoring is Implementable. The deed notices and land use restrictions may be difficult to obtain and enforce.	Personnel, equipment, and facilities for implementation of technologies associated with this alternative are readily available.	Personnel, equipment, and facilities for implementation of technologies associated with this alternative are readily available.	Personnel, equipment, and facilities for implementation of technologies associated with this alternative are readily available.
Cost (\$)					
Capital Cost	\$0	\$99,040	\$1,503,490	\$671,880	\$1,161,670
Annual O&M	\$0	\$2,580	\$2,580	\$3,530	\$3,530
Present Worth	\$0	\$110,210	\$1,514,660	\$726,140	\$1,215,930

**Table 17**  
**Detailed Analysis of Alternatives - Site 3, OU No. 3**  
**RSR Cooperation Superfund Site**

<b>Evaluation Criteria</b>	<b>Alternative 1a: No Action</b>	<b>Alternative 1b: Institutional Controls and Monitoring</b>	<b>Alternative 2: Removal and Monitoring</b>	<b>Alternative 3: Excavation, Surface Controls, Containment, and Monitoring</b>
Overall Protection of Human Health and the Environment	Not protective of human health and the environment. This alternative will not reduce the community and environmental exposure to contaminated materials. Does not achieve RAOs for soils, sediments, or surface water.	Not protective of human health and the environment. This alternative will not reduce environmental exposure to contaminated materials and only marginally reduces the community exposure. The trespasser exposure is not reduced. Does not achieve RAOs for soils, sediments, or surface water.	This alternative is protective of human health and the environment. RAOs are met for soils, sediments, and surface water.	This alternative is protective of human health and the environment. RAOs are met for soils, sediments, and surface water.
Compliance with ARARs	This alternative does not comply with ARARs identified for OU No. 3. Specifically, RCRA characteristic wastes will remain in an uncontrolled state and RCRA requirements (30 T.A.C. § 335.8) for closure and remediation will not be met.	This alternative does not comply with ARARs identified for OU No. 3. Specifically, RCRA characteristic wastes will remain in an uncontrolled state and RCRA requirements (30 T.A.C. § 335.8) for closure and remediation will not be met.	This alternative complies with ARARs. Specifically, RCRA closure and remediation requirements (30 T.A.C. § 335.8).  RCRA handling, transportation, treatment, and disposal requirements (30 T.A.C. § 335.11, § 335.91, § 335.111 and § 335.112) will be met.  By managing soils, battery chips, and slag, storm runoff and surface water quality will improve to help meet the intent of 40 CFR Parts 120 and 125.	This alternative complies with ARARs. Specifically, RCRA closure and remediation requirements (30 T.A.C. § 335.8).  Closure requirements (30 T.A.C. § 330.251) for municipal solid waste landfills will be met.  RCRA handling, transportation, treatment, and disposal requirements (30 T.A.C. § 335.11, § 335.91, § 335.111 and § 335.112) will be met.  By managing soils, battery chips, and slag, storm runoff and surface water quality will improve to help meet the intent of 40 CFR Parts 120 and 125.
Long-Term Effectiveness and Permanence	Long-term effectiveness and permanence is not achieved. No removal of contaminated media from the Site.	Long-term effectiveness and permanence is not achieved. No removal of contaminated media from the Site.	Long-term effectiveness and permanence achieved by this alternative by removing soils, battery chips, and slag exceeding target cleanup levels.	Moderate long-term effectiveness and permanence achieved by this alternative by capping soil, battery chip, and slag. The cap is not permanent and requires long-term monitoring and maintenance.
Reduction of Toxicity, Mobility, or Volume through Treatment	No reduction in toxicity, mobility, or volume of contaminated media.	No reduction in toxicity, mobility, or volume of contaminated media.	Containment but no reduction in mobility for wastes stabilized in RCRA Subtitle C landfill. No reduction of toxicity or volume.	Containment but no reduction of mobility of metals-contaminated soils, battery chips, and slag. No reduction in toxicity or volume.
Short-Term Effectiveness	Short-term effectiveness not achieved. No removal of contaminated media from the Site.	Short-term effectiveness not achieved. No removal of contaminated media from the Site.	Short-term risk to the community may increase during implementation. Dust control measures will be implemented during excavation. Heavy vehicular traffic may cause some nuisance to the community. There is potential for worker exposure during excavation. All appropriate regulations and safety measures will be instituted and strictly enforced.	Short-term risk is minimal in this alternative. Heavy vehicular traffic may cause some nuisance to the community during cap construction.
Implementability	Implementable.	Monitoring is implementable. The deed notices and land use restrictions may be difficult to obtain and enforce.	Personnel, equipment, and facilities for implementation of technologies associated with this alternative are readily available.	Personnel, equipment, and facilities for implementation of technologies associated with this alternative are readily available.
Cost (\$)				
Capital Cost	\$0	\$344,350	\$1,620,810	\$1,175,610
Annual O&M	\$0	\$6,530	\$6,540	\$4,490
Present Worth	\$0	\$372,620	\$1,649,120	\$1,244,630

**Table 18**  
**Detailed Analysis of Alternatives - Site 4, OU No. 3**  
**RSR Corporation Superfund Site**

<b>Evaluation Criteria</b>	<b>Alternative 1a: No Action</b>	<b>Alternative 1b: Institutional Controls and Monitoring</b>	<b>Alternative 2: Removal and Monitoring</b>	<b>Alternative 3: Protective Cap, Removal, and Monitoring</b>	<b>Alternative 4: Composite Cap, Removal, and Monitoring</b>
Overall Protection of Human Health and the Environment	Not protective of human health and the environment. This alternative will not reduce the community and environmental exposure to contaminated materials. Does not achieve RAOs for soils, sediments, or surface water.	Not protective of human health and the environment. This alternative will not reduce environmental exposure to contaminated materials and only marginally reduces the community exposure. The trespasser exposure is not reduced. Does not achieve RAOs for soils, sediments, or surface water.	This alternative is protective of human health and the environment. RAOs are met for soils, sediments, and surface water.	This alternative is protective of human health and the environment. RAOs are met for soils, sediments, and surface water.	This alternative is protective of human health and the environment. RAOs are met for soils, sediments, and surface water.
Compliance with ARARs	This alternative does not comply with ARARs identified for OU No. 3. Specifically, RCRA characteristic wastes will remain in an uncontrolled state and RCRA requirements (30 T.A.C. § 335.8) for closure and remediation will not be met.	This alternative does not comply with ARARs identified for OU No. 3. Specifically, RCRA characteristic wastes will remain in an uncontrolled state and RCRA requirements (30 T.A.C. § 335.8) for closure and remediation will not be met.	This alternative complies with ARARs. Specifically, RCRA closure and remediation requirements (30 T.A.C. § 335.8) will be met.  RCRA handling, transportation, treatment, and disposal requirements (30 T.A.C. § 335.11, § 335.91, § 335.111 and § 335.112) will be met.  By managing soils, battery chips, and slag, storm runoff and surface water quality will improve to help meet the intent of 40 CFR Parts 120 and 125.	This alternative complies with ARARs. Specifically, RCRA closure and remediation requirements (30 T.A.C. § 335.8) will be met.  Closure requirements (30 T.A.C. § 330.251) for municipal solid waste landfills will be met.  RCRA handling, transportation, treatment, and disposal requirements (30 T.A.C. § 335.11, § 335.91, § 335.111 and § 335.112) will be met.  By managing soils, battery chips, and slag, storm runoff and surface water quality will improve to help meet the intent of 40 CFR Parts 120 and 125.	This alternative complies with ARARs. Specifically, RCRA closure and remediation requirements (30 T.A.C. § 335.8) will be met.  Closure requirements (30 T.A.C. § 330.251) for municipal solid waste landfills will be met.  RCRA handling, transportation, treatment, and disposal requirements (30 T.A.C. § 335.11, § 335.91, § 335.111 and § 335.112) will be met.  By managing soils, battery chips, and slag, and sediments, storm runoff and surface water quality will improve to help meet the intent of 40 CFR Parts 120 and 125.
Long-Term Effectiveness and Permanence	Long-term effectiveness and permanence is not achieved. No removal of contaminated media from the Site.	Long-term effectiveness and permanence is not achieved. No removal of contaminated media from the Site.	Long-term effectiveness and permanence is not achieved. No removal of contaminated media from the Site.	Moderate long-term effectiveness and permanence achieved by this alternative by capping soil, battery chip, and slag. The cap is not permanent and requires long-term monitoring and maintenance.  Long-term effectiveness and permanence achieved for the excavated soils at the Jaycee Park.	Moderate long-term effectiveness and permanence achieved by this alternative by removing sediments and capping soil, battery chip, and slag. The cap is not permanent and requires long-term monitoring and maintenance.  Long-term effectiveness and permanence achieved for the excavated soils at the Jaycee Park.
Reduction of Toxicity, Mobility, or Volume through Treatment	No reduction in toxicity, mobility, or volume of contaminated media.	No reduction in toxicity, mobility, or volume of contaminated media.	Containment but no reduction in mobility for wastes stabilized in RCRA Subtitle C landfill. No reduction of toxicity or volume.	Containment but no reduction of mobility of metals-contaminated soils, battery chips, and slag. No reduction in toxicity or volume.	Containment but no reduction of mobility of metals-contaminated soils, battery chips, and slag through containment; however, no reduction in toxicity or volume.
Short-Term Effectiveness	Short-term effectiveness not achieved. No removal of contaminated media from the Site.	Short-term effectiveness not achieved. No removal of contaminated media from the Site.	Short-term risk to the community may increase during implementation. Dust control measures will be implemented during excavation. Heavy vehicular traffic may cause some nuisance to the community. There is potential for worker exposure during excavation. All appropriate regulations and safety measures will be instituted and strictly enforced.	Short-term risk is minimal in this alternative. Heavy vehicular traffic may cause some nuisance to the community during cap construction.	Short-term risk is minimal in this alternative. Heavy vehicular traffic may cause some nuisance to the community during cap construction and sediment removal.
Implementability	Implementable.	Monitoring is Implementable. The deed notices and land use restrictions may be difficult to obtain and enforce.	Personnel, equipment, and facilities for implementation of technologies associated with this alternative are readily available.	Personnel, equipment, and facilities for implementation of technologies associated with this alternative are readily available.	Personnel, equipment, and facilities for implementation of technologies associated with this alternative are readily available.
Cost (\$)					
Capital Cost	\$0	\$311,260	\$5,958,810	\$3,528,600	\$8,273,880
Annual O&M	\$0	\$4,230	\$4,230	\$3,970	\$5,910
Present Worth	\$0	\$329,570	\$5,977,120	\$3,589,630	\$8,364,730

## **Community Acceptance**

Comments were received from the community during the public comment period which opened July 3, 1996, and closed August 4, 1997. A public meeting was held on July 24, 1997 to receive comments. All comments received have been addressed, and responses are included in the Responsiveness Summary (**Appendix A**) to this ROD. EPA carefully considered all comments in making the final decision on the selected remedial action for each of the OU No. 3 sites, Sites 1, 3 and 4.

### **X. THE SELECTED REMEDY**

Based upon consideration of the requirements of CERCLA, the detailed analysis using the nine criteria, and the public comments, EPA has determined the most appropriate remedies for the OU No. 3 sites of the RSR site are as follows:

**Site 1** - Alternative 2 - Removal; Off-site Disposal; Monitoring

**Site 3** - Alternative 3 - Protective Cap; Monitoring

**Site 4** - Alternative 3 - Protective Cap; Removal; Monitoring

The major components of the remedy for each of the OU No. 3 sites include:

#### **Site 1** - Alternative 2

- Excavation and removal of slag, battery chips and metals-contaminated soils exceeding cleanup goals to a depth of two feet (estimated 78,960 square feet);
- Excavation and removal of sediments in the intermittent creek exceeding cleanup goals (estimated 380 cubic yards);
- Backfilling and regrading of excavated areas using clean soil;
- Off-site disposal of the excavated material (i.e. slag, battery chips, soil and sediments) in an appropriate landfill, depending on TCLP analysis and the whether material is classified as hazardous or nonhazardous for disposal;

- Monitoring of surface water;
- No action is recommended for the shallow ground water.
- **Figure 31** illustrates the areas to be addressed under Alternative 2 for Site 1.

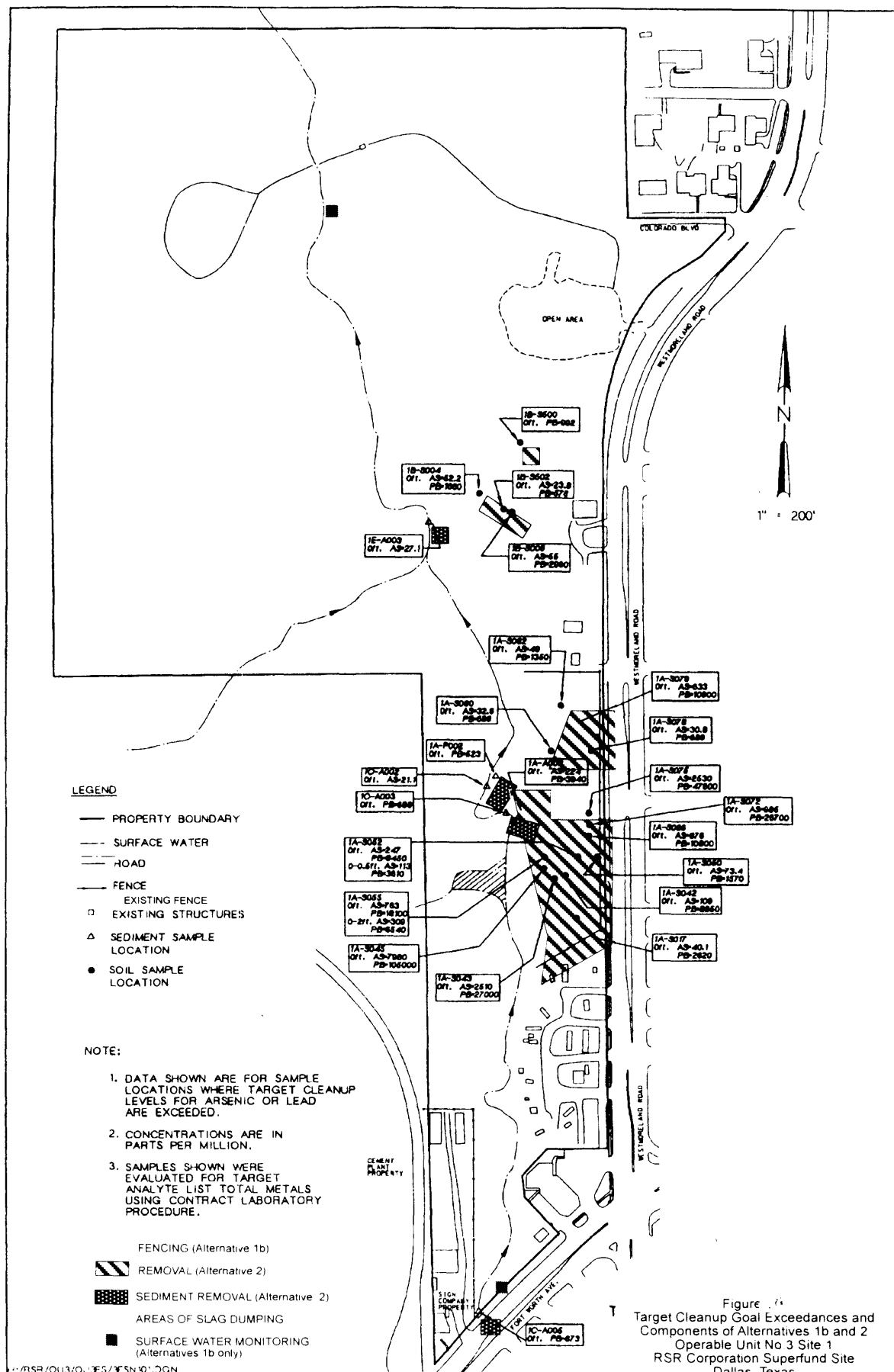
**Site 3** - Alternative 3

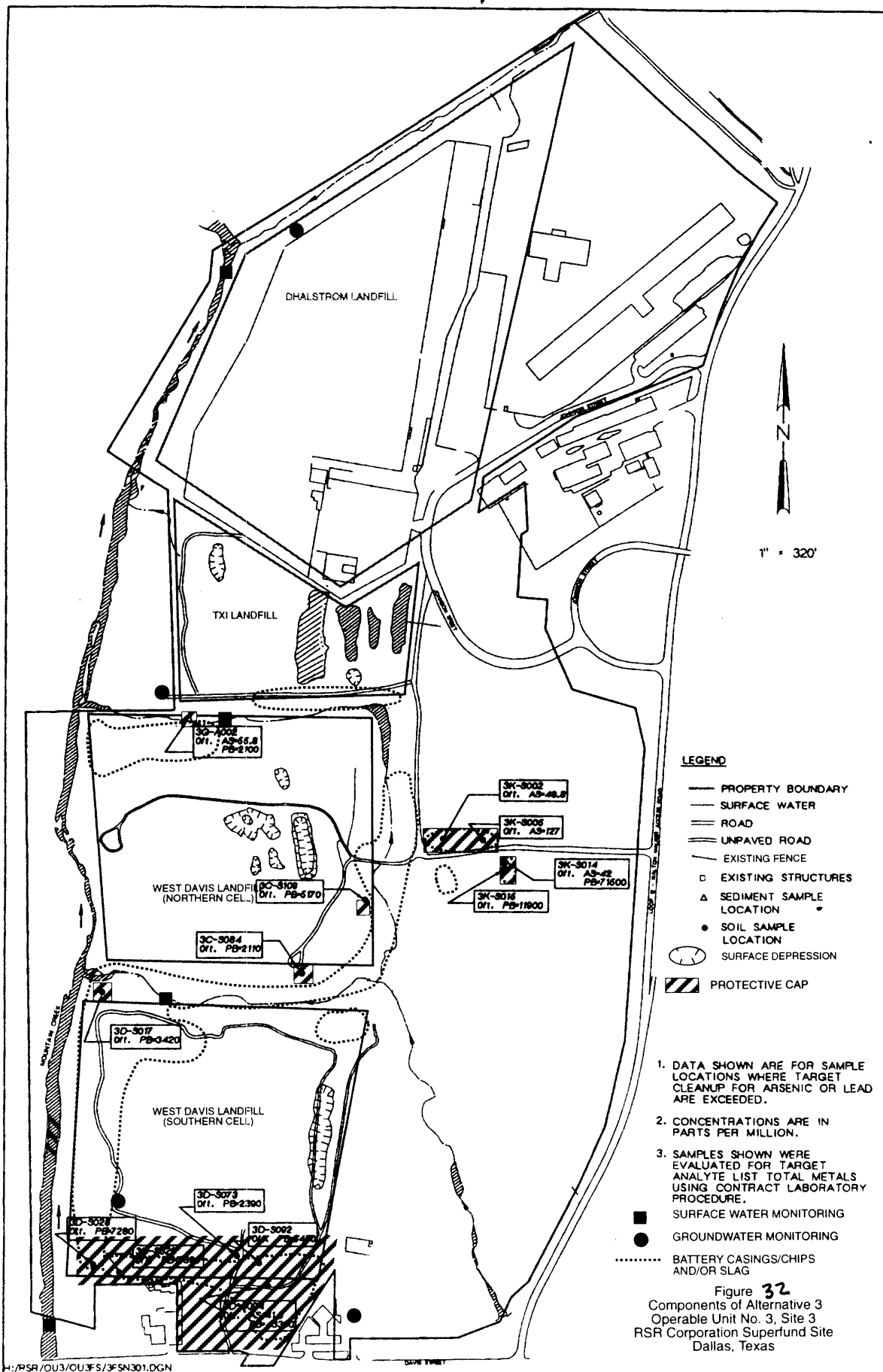
- Containment (protective soil cap) of the southern portion and isolated areas the northern cell of the West Davis landfill where there is exposed slag, battery chips and metals-contaminated soil that exceed cleanup goals;
- Monitoring of surface water and ground water and annual inspection of the cap.
- No action is recommended for the shallow ground water.
- **Figure 32** illustrates the areas to be addressed under Alternative 3 for Site 3.

**Site 4** - Alternative 3

- Containment (protective soil cap) of area within the Nomas and West Dallas landfills where there is exposed slag, battery chips and metals-contaminated soil that exceed cleanup goals;
- Excavation of areas of surficial contamination where cleanup goals are exceeded in Jaycee Park and placement under the protective cover in the West Dallas landfill (nonhazardous material) or transported and disposed off-site (hazardous material);
- Monitoring of surface water and ground water and annual inspection of the cap.
- No action is recommended for the shallow ground water.
- **Figure 33** illustrates the areas to be addressed under Alternative 3 for Site 4.

The shallow ground water beneath the Sites 1, 3 and 4 of OU No. 3 are not considered to be a potential drinking water supply (i.e. a Class III aquifer).







All activities will be in compliance with federal and State ARARs, specifically those for RCRA closure and remediation, RCRA handling, transportation, treatment and disposal requirements, and specific ARARs for air quality during remediation. **Appendix B** includes the ARARs analysis for OU No. 3. In addition, all off-site disposal of material must in compliance with EPA's Off-site Policy at the time of disposal.

The estimated time for completion for each of the selected remedies is less than one year and the estimated costs for each of the selected remedies is as follows:

**Site 1** - Alternative 2 - Removal; Off-site Disposal; Monitoring

Capital Costs:	\$ 1,503,490
Annual Operation & Maintenance:	\$ 2,580
Present Worth:	\$ 1,514,660

**Site 3** - Alternative 3 - Protective Cap; Monitoring

Capital Costs:	\$ 1,174,610
Annual Operation & Maintenance:	\$ 4,490
Present Worth:	\$ 1,244,630

**Site 4** - Alternative 3 - Protective Cap; Removal and Monitoring

Capital Costs:	\$ 3,528,600
Annual Operation & Maintenance:	\$ 3,970
Present Worth:	\$ 3,589,630

**Remedial Action Goals or Cleanup Goals**

The purpose of this remedial action is to control risks posed by direct contact, ingestion, and inhalation of the contaminated material associated with the slag, battery chips and metals-contaminated soils found at Sites 1, 3 and 4 of OU No. 3. The results of the baseline risk assessment indicate that the greatest excess lifetime cancer risk (RME) at Site 1 is  $9 \times 10^{-3}$ , primarily from ingestion by the current residential child. This risk relates primarily to ingestion of arsenic. For Site 3, the greatest excess lifetime cancer risk (RME) is  $1 \times 10^{-5}$  from inhalation, ingestion and dermal contact (RME) by the future worker. This risk relates significantly to the exposure (inhalation and ingestion) of arsenic. The greatest excess lifetime cancer risk (RME) at Site 4 is  $1 \times 10^{-5}$  from inhalation,

ingestion, and dermal contact of the future worker. Arsenic also contributes significantly to the risk from inhalation and ingestion for Site 4. Exposure to lead on each of these sites was also determined to be present at unacceptable levels. A model used to predict child and adult blood-lead levels residents (child - Site 1) and for future workers (adult - Sites 3 and 4).

For Site 1, the remedy will address arsenic in excess of 20 ppm, and/or lead in excess of 500 ppm present in the slag, battery chips and soils. The 20 ppm corresponds to the acceptable level of arsenic based on current and future residential use. The 500 ppm is predicted by the IEUBK Lead Model also for current and future residential land use.

For Site 3, the remedy will address arsenic in excess of 32.7 ppm, and/or lead in excess of 2,000 ppm present in the slag, battery chips and soils. The 32.7 ppm corresponds to the acceptable level of arsenic based on future industrial use. The 2,000 ppm is predicted by the Adult Lead Model also for future industrial land use.

For Site 4, excluding Jaycee Park, the remedy will address arsenic in excess of 32.7 ppm, and/or lead in excess of 2,000 ppm present in the slag, battery chips and soils. The 32.7 ppm corresponds to the acceptable level of arsenic based on future industrial use. The 2,000 ppm is predicted by the Adult Lead Model also for future industrial land use.

For Jaycee Park, the remedy will address arsenic in excess of 20 ppm, and/or 108 ppm of antimony, and/or lead in excess of 2,000 ppm present in the slag, battery chips and soils. The 32.7 ppm corresponds to the acceptable level of arsenic based on future industrial use. The 108 ppm of antimony is based on a Hazard Index less than one. The 2,000 ppm is predicted by the Adult Lead Model also for future industrial land use.

## **XI. STATUTORY AUTHORITY FINDINGS AND CONCLUSIONS OF LAW**

Pursuant to CERCLA, studies are conducted at NPL sites to characterize the nature and extent of contamination associated with a particular source of contamination and to determine the most feasible cleanup approaches. At OU No. 3, EPA conducted a remedial investigation, feasibility study, and risk assessment to determine the nature and extent of site contamination.

The statutory determinations that are required for remedy selection are in Section 121 of CERCLA, 42 U.S.C. § 9621. Under

CERCLA, EPA must select remedies that are protective of human health and the environment, comply with ARARs (unless a statutory waiver is justified), are cost effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduces the volume, toxicity, or mobility of hazardous wastes as their principle element. The following sections discuss how the selected remedy for each of the OU No. 3 sites meets these statutory requirements.

#### Protection of Human Health and the Environment

The selected remedy for Site 1 of OU No. 3 protects human health and the environment by addressing releases or threats of releases of hazardous substances by removal and off-site disposal of slag, battery chips and metals-contaminated soils. The selected remedy for Site 1 will minimize the threat of exposure to the arsenic and lead present on site through ingestion, inhalation, and direct contact. By removal and off-site disposal of the slag, battery chips and soils the cancer risks from exposure will be reduced to less than  $1 \times 10^{-6}$ , which falls within the EPA's acceptable risk range of  $10^{-4}$  to  $10^{-6}$ . There are no short-term threats associated with the selected remedy that cannot be readily controlled. In addition, no adverse cross-media impacts are expected from the activities.

For Sites 3 and 4 of OU No. 3 the selected remedy protects human health and the environment by addressing releases or threats of releases of hazardous substances through containment of the slag, battery chips and metals-contaminated soils. The selected remedy for Sites 3 and 4 will minimize the threat of exposure to the arsenic and lead present on site through ingestion, inhalation, and direct contact. By containment of the contaminated slag, battery chips and soils the cancer risks from exposure will be reduced to less than  $1 \times 10^{-6}$ , which falls within the EPA's acceptable risk range of  $10^{-4}$  to  $10^{-6}$ . There are no short-term threats associated with the selected remedy that cannot be readily controlled. In addition, no adverse cross-media impacts are expected from the activities.

#### Compliance with Applicable or Relevant and Appropriate Requirements

The selected remedy will comply with ARARs. The complete ARARs analysis, determinations and justification for ARARs for OU No. 3 of the RSR site is presented in **Appendix B**.

The following CERCLA requirement must also be complied with as part of the selected remedy for Site 1: All disposal off-site will be at facilities in compliance with EPA's Off-site Policy, specifically all hazardous substances, pollutants or contaminants removed off-site pursuant to this action for treatment, storage, or disposal shall be treated, stored, or disposed of at a facility in compliance with RCRA, as determined by EPA, pursuant to CERCLA Section 121(d)(3), 42 U.S.C. § 9621 (d)(3), and the following rule: "Amendment to the National Oil and Hazardous Substances Pollution Contingency Plan; Procedures for Planning and Implementing Off-Site Response Action: Final Rule." 58 FR 49200 (September 22, 1993), and codified at 40 C.F.R. § 300.440.

#### Cost-Effectiveness

EPA believes that this remedy would provide a significant reduction of the risks to human health and the environment at an estimated cost of \$1,514,660 for Site 1, \$1,244,630 for Site 3 and \$3,589,630 for Site 4. Therefore, the selected remedy provides an overall effectiveness proportionate to its costs, such that it represents a reasonable value for the money that will be spent.

#### Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

EPA believes the selected remedy represents the maximum extent to which permanent solutions and treatment/resource recovery technologies can be utilized in a cost-effective manner for the types of materials and contaminants at OU No. 3 of the RSR Site. Of those alternatives that are protective of human health and the environment and comply with ARARs, EPA has determined that the selected remedy for Sites 1, 3 and 4 provide the best balance in considering long-term effectiveness and permanence; reduction in toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; and cost; as well as considering the statutory preference for treatment as a principal element, and considering State and community acceptance.

#### Preference for Treatment as a Principal Element

The remedy for Site 1 of OU No. 3 utilizes permanent solutions and alternative treatment to the maximum extent practicable through removal and off-site disposal of the slag, battery chips and metals-contaminated soils. However, due to the size of the landfills present on Sites 3 and 4, it was determined

impracticable to excavate and treat the chemicals of concern effectively. Thus, the remedy for Sites 3 and 4 of Operable Unit No. 3 does not satisfy the statutory preference for treatment as a principal element of the remedy.

Because this remedy will result in hazardous substances remaining on-site above health-based levels, allowing for future industrial use, five-year reviews will be necessary at OU No. 3 of the RSR Site to ensure that the remedy continues to provide adequate protection of human health and the environment.

## **XII.     DOCUMENTATION OF SIGNIFICANT CHANGES**

The Proposed Plan for OU No. 3 of the RSR Site was released for public comment on July 3, 1997. The Proposed Plan identified Alternative 2 - Removal and Monitoring for Site 1, Alternative 3 - Protective Cap and Monitoring for Site 3 and Alternative 3 - Protective Cap, Removal and Monitoring for Site 4, as the preferred alternatives. EPA reviewed all written and verbal comments submitted during the public comment period. Upon review of these comments, it was determined that no significant changes to the remedy, as originally identified in the Proposed Plan, were necessary.

## Appendix A

### Responsiveness Summary

**RESPONSIVENESS SUMMARY  
RSR CORPORATION SUPERFUND SITE  
OPERABLE UNIT NO. 3  
DALLAS, DALLAS COUNTY, TEXAS**

**INTRODUCTION**

The United States Environmental Protection Agency (EPA) has prepared this Responsiveness Summary for the RSR Corporation Superfund Site (RSR Site), as part of the process for making final remedial action decisions for Operable Unit No. 3 (OU No. 3). This Responsiveness Summary documents, for the Administrative Record, public comments and issues raised during the public comment period on EPA's recommendations presented in the Proposed Plan for the three (3) landfill/slag areas of the RSR Site, OU No. 3, and provides EPA's responses to those comments. EPA's actual decisions for OU No. 3 are detailed in the Record of Decision (ROD) for OU No. 3. Pursuant to Section 117 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. § 9617, EPA has considered all comments received during the public comment period in making the final decision contained in the ROD for OU No. 3.

**OVERVIEW OF PUBLIC COMMENT PERIOD**

EPA issued its Proposed Plan detailing remedial action recommendations for OU No. 3 for public review and comment on July 3, 1997. Documents and information EPA relied on in making its recommendations in the Proposed Plan were made available to the public on or before July 3, 1997 in three Administrative Record File locations, including the West Branch of the Dallas Public Library located at the RSR Site. EPA provided thirty days for public comment. No requests were received by EPA to extend the comment period and it closed on August 4, 1997.

EPA held a public meeting to receive comments and answer questions on July 24, 1997, at the Marillac Social Center located at 2827 Lapsley Road in west Dallas, Texas. All written comments as well as the transcript of verbal comments received during the public comment period are included in the Administrative Record for OU No. 3 and are available at the three Administrative Record repositories.

## **COMMENTS AND ISSUES RAISED DURING THE COMMENT PERIOD**

### **1. Public Meeting, July 24, 1997, Marillac Social Center- Citizen's Comments at the Public Meeting**

**Comment:** Why isn't the City of Dallas represented on your panel?

**Response:** EPA can not speak for the city, but EPA has an open door policy for the city and elected representatives to participate in all of our meetings. EPA would welcome the city's participation in the decision making process for the RSR site.

**Comment:** What is the timetable for the cleanup for the OU 3 site?

**Response:** Once construction activities start, the construction phase should take from six (6) to nine (9) months to complete. The work is not technically difficult to conduct and would generally consist of earth work type construction. The time consuming phase of the project is to secure funds through the EPA Superfund program or sign an agreement with the Potential Responsible Parties to implement the selected remedial action.

**Comment:** What are the lead levels currently existing in OU 3, and what levels do you propose to bring it down to? What would be the proposed uses for that property once it's cleaned up?

**Response:** Site 1 is currently zoned for residential land use. Since the Site 1 is not a former landfill but a disposal area, EPA is proposing to excavate and remove the contamination to residential levels. To be consist with the cleanup levels used at other RSR residential areas, the lead cleanup will be to 500 parts per million (ppm), which is the level that is protective for children and of course adults. Site 3 includes several former landfill areas operated by the City of Dallas. Site 3 is zoned primarily for industrial/ commercial use. EPA proposes, therefore, to implement a remedy that will provide protection for future industrial/commercial use. The cleanup levels were based on the risk assessment conducted for the site and are consistent with the cleanup levels selected for the former smelter facility (OU No. 4). The cleanup level for lead will be 2,000 ppm which is protective for future

industrial/commercial use. Site 4 also includes several landfill areas operated by the City of Dallas. Most of Site 4 is zone for residential land use. EPA, TNRCC, and the City of Dallas Department of Environmental and Human Services do not believe that these former landfill areas should be zoned for residential use. EPA has requested that the Dallas Planning Department change the zoning in this area to non-residential land use. EPA's proposed remedy for Site 4 is protective for non residential land use.

**Comment:** When the cleanup is being conducted, is there any chance of contaminating other areas?

**Response:** Various engineering control methods, such as air monitoring, adding water to reduce dust, and silt fence construction, will be used during cleanup activities to control migration of contaminants to other areas. In addition, where excavation activities are conducted to remove contaminants, confirmation samples will be collected and analyzed to ensure that the remedial action cleanup goals are met.

**Comment:** I would like to know, after you finish cleaning up everything, will it be safe for the residents that live in this area? Can you say it will be safe?

**Response:** Yes, the residential areas will be safe from smelter related contamination once the RSR site cleanups are completed. The purpose of the remedial action is to provide protection to human health and the environment.

**Comment:** I also would like to know, with the wind carrying pollution in the air, have you considered that there are other areas that you haven't tested that could have the same problem?

**Response:** EPA did take air deposition and other factors into consideration in the extensive investigations, studies, and cleanups that have been conducted in west Dallas. Every yard within approximately a one-half (½) mile radius of the smelter facility was sampled to determine if contaminants above health based levels were present, if they were, cleanup activities were conducted. In other locations outside the air deposition area, visual inspections were conducted at 6,800 properties to determine if battery chips or slag materials were present. Over 1,000 properties have been sampled and thousands of soil, water, dust, and paint samples have been analyzed to determine the areas that

needed cleanup. EPA's efforts have been extensive in identifying areas that were contaminated with smelter related contaminants.

**Comment:** I would like to know, the lead facility up here, are you going to fence that off and put up a danger sign or a toxic sign or something or just let it sit there? What are y'all going to do about that?

**Response:** A remedy has been selected for the smelter facility (OU No. 4), which includes demolition in a controlled manner of the smelter stack and other buildings and off-site disposal at permitted facilities. Also included in the selected remedy is removal of the pavement foundation, contaminated soils, and debris and disposal off-site to a permitted facility.

**Comment:** I was looking at the area where you underlined where a lot of soil was buried. I really wasn't ready to comment on this tonight, but I still would like to mention that there are other places. I know because my father worked at the facility. Maybe they should be checked, too.

**Response:** If you are referring to the area shown on the site figure as OU No. 5, EPA has investigated this area extensively. EPA has documented areas where contaminated soils were buried and also a landfill is located at this site. The proposed remedy for OU No. 5 has been discussed with the community and a remedy to address OU No. 5 was signed on April 3, 1997. The information for OU No. 5 and all the other operable units is available for public review at the Dallas Public Library - West Branch located at 2332 Singleton Blvd.

**Comment:** On the area that you cleaned up before, y'all moved the stuff to Oklahoma. Some of the people out in the city are moving stuff right over to their next-door neighbor in the yards and the dumps. They're contaminating the whole city of Dallas. I'm puzzled by how y'all are planning on moving this contaminated soil or moving these people. Are you planning on moving these people out when you clean up, or are you going to go through the same thing that we went through to clean up the west Dallas area?

**Response:** For all of the cleanups that EPA has conducted in west Dallas, the contaminated soils were removed from west Dallas and disposed of at permitted facilities. The Dallas

Housing Authority also removed all building materials and contaminated soils and disposed of them off-site.

The proposed remedies for OU No. 3 will not required that people be moved or relocated. People do not live within the contaminated areas of OU No. 3. Control measures will be taken during cleanup activities to ensure that contaminants do not move off-site.

**Comment:** I noticed you mentioned about you want to change one of the areas over to a commercial place, when you can bring it up to 2,000. That's a cop-out. Whenever you feel like you can't get something down to a certain level, then you want to raise up the lead level. That is wrong. If you are going to do that, why don't you just move the people out, which I asked for some time ago. Move the people out and make it commercial; but don't let part of the people stay in the money area and put another plant in another area, contaminating the same people.

**Response:** EPA is not requesting that the city change the zoning in the former landfill sites because they can not be cleaned to residential levels. EPA recommends the zoning change because the Agency does not believe that residences should be built on top of former landfills. EPA does not want to condone building homes on top of these landfills by cleaning the site to residential standards; EPA believes that it would be a waste of money to do so. Right now people do not live on top of these landfills and therefore no relocations are required.

**Comment:** Why bring it over to 2,000 and then let these other people create a problem when it's under 500? You're going to bring them under 500 and say it's safe when next door you're going to have 2,000. So that is the problem I'm having.

**Response:** The cleanup levels at residential properties and commercial properties are based on life time exposure and conservative assumptions. Residential levels are based on exposure to children, the most sensitive group, and based upon assumptions that they would ingest 100 milligrams of contaminated soil a day for 365 days a year. Since children do not live in commercial areas, the commercial levels are based on adult ingestion of 50 milligrams of contaminated soil for 219 days a year.

**Comment:** Y'all spending millions of dollars out here; and it's going into bulldozing, moving one contaminated piece of soil over to another in the same area. You got contaminated soil up there at RSR, and you're coming out with your demolition you got over there, and then you've contaminated every one of the areas around here. And still y'all are promising them other people, and you're still trying to say you're going to clean it up. So the better thing to do is trying to get to the root of it, trying to get it all stopped, and quit trying to clean up something you can't clean up and go and try to treat the people like they supposed to be treated. If you can't do it right, move them out. If you can't clean up the place where a man's staying there safe and all that, then clear them people out. And that's all anybody asked you to do from the beginning.

**Response:** EPA is cleaning up the contamination in west Dallas to health based levels so people can live and work in a healthy environment. EPA does not believe that relocating the residents of west Dallas is necessary.

**Comment:** Have you made a decision on what process you're going to use, or are you going through the alternatives that you have listed, or what? Have you made a decision?

**Response:** No, a decision on the alternatives that will be used to address the OU No. 3 site contamination has not been made. This public meeting is part of the decision making process that is used to receive comments from members of the community to determine which alternatives they believe would do the job better or for members of the community to present their own alternatives. EPA will evaluate all comments and suggestions made at this public meeting or submitted in writing before making a final selection of the remedy.

**Comment:** The site description and history for OU 3 consisted of three separate slag piles and landfill sites, which are labeled 1, 3, and 4, because 2 is in OU 5. This is the same waste material and contamination that was in OU 1, the residential area. So, in effect, you used the same criteria basically for making your selection on what procedures you want to perform, right? And you have nine standards of evaluation that you used in your process for selecting the alternatives? And you labeled this particular site as being a very low threat as far as human health was concerned?

**Response:** The contamination identified at OU No. 3 is the same smelter type contamination that was present in the residential areas and is present at OUs 4 and 5. EPA is applying the same cleanup standards at OU No. 3 as have been applied in the residential areas and the smelter facility. Extensive investigations were conducted at each operable unit to determine the full extent of contamination and to identify the areas that exceed health base cleanup levels. Each of the alternatives presented in the Proposed Plan was evaluated based on the nine standards used in the selection of the remedial alternative. Based on this evaluation, EPA is presenting it's preferred alternative. The statement in the Proposed Plan that stated that OU No. 3 is a low level threat is based on Superfund criteria used in determining if principal and low level treat contaminants are present at the site. It does not mean that the site does not pose a threat to human health or the environment or that the site contamination does not needs to be addressed.

**Comment:** Basically what I'm trying to get to is, if you used the same standard for evaluating the one site, which was OU 1, based on the same material, which was waste material, battery chips, and slag material that was brought from the smelter to the landfill to be dumped there, then it was the same material being dumped in OU 1, in the residential area driveways and landfill around their homes. And I'm saying, if you used the same standard, the same process of evaluation of OU 1 as well as OU 3, is there a difference there somewhere in OU 3, especially at site 4, that would raise the level of environmental contamination that would constitute you going from a residential area to a commercial area?

**Response:** The same standards and criteria were used for both OU 1 and OU 3. There are important differences between OU 3 Site and OU No. 1 which affect EPA's decision as to the appropriate clean-up levels. The most important difference is that people actually reside in OU 1, but no people reside within OU 3 Site 4. OU 1 was cleaned up to residential standards because people are living there. Other options can be considered in the case of OU 3 Site 4 because, while the area is zoned residential, no people actually live there. Another significant difference between OU1 and OU 3 Site 4 is that OU 3 Site is a huge landfill that contains many different types of materials, making it an undesirable and unlikely location for residential development in the future. EPA believes that it would not be a wise use of money to clean up an area to residential standards that is

unlikely to be developed into a residential area. OU 3 Site 4 should more appropriately be compared to OU 3 Site 3 which is also a huge landfill. Site 3 was not zoned for residential use and EPA believes that Site 4 should also not be zoned for residential use.

**Comment:** I'm still a little confused about a comment you made to the second speaker pertaining to lowering the lead contamination factor down to 100 parts per million on the cleanup. He asked you when you make this cleanup how low you're planning to bring this down in these areas. Were you misquoted when you say 100 parts per million?

**Response:** My statement was that at Site 1 the cleanup level would be 500 parts per million (ppm), the same as was used in the residential areas of OU No. 1. However, in the process of cleaning up areas that exceed the 500 ppm levels, typically the resulting levels are much lower than 500 ppm; in some cases as low as 100 ppm. This is typically what EPA encountered during the cleanup activities at OU No. 1, the high contaminant levels were in the upper 3 or 4 inches. However, the cleanup was conducted at 6-inch intervals which results in much lower than 500 ppm levels remaining at the site. EPA never tries to clean to exactly the 500 ppm level, if the level is 550 ppm, EPA does not just clean 1 inch of soil, we go the full 6-inches which will result in a much lower lead level.

**Comment:** But I'm still a little confused. I'm talking about, how low do you plan to bring sites 1, 3, and 4 down to? We know you took OU 1 down to 500 parts per million. Are you going to be able to do this on a landfill site and make a sincere effort to move all this material to a dump site? But if it's going to be a commercial site, then lowering it to 500 parts per million is not a requirement and spending millions of dollars per site isn't required.

**Response:** For site 1 of OU No. 3, EPA plans to conduct a cleanup of those areas that exceed the 500 ppm lead level and dispose of those materials at permitted landfill facilities just as was done for the residential areas of OU No. 1. For sites 3 and 4, areas which are already landfill sites, EPA does not propose to remove materials from one landfill site and take it to another landfill site. Therefore, at sites 3 and 4 of OU No. 3, the remedial alternative would be to place a clean soil cap over the areas that exceed the cleanup levels of 2,000 ppm for

commercial land use and thereby prevent exposure, inhalation, and ingestion of the contaminated materials.

**Comment:** If you could get all the landfill sites zoned commercial, rather than residential, then we won't have a future problem of people selling it for residential property and moving people in on it and putting lives at risk. If you can get all four locations, even in OU 5 zoned to commercial standard, then we could eliminate the problem and go with a lesser cost, rather than trying to bring OU 3, site 4 down to residential standard. But we need to do it for all of the properties, not just one.

**Response:** EPA agrees that those locations that at one time were commercial or industrial should be cleaned to those standards. EPA agrees that Site 4 of OU No. 3, which is now zoned for residential use, should be changed to commercial use. The Record of Decision for OU No. 5 called for the site to be addressed for future commercial/industrial use. So the decision for OU No. 5 has been made. Site 1 of OU No. 3, on the other hand, has never been used for industrial or commercial purposes and EPA believes that it can be adequately cleaned up to residential standards at a reasonable cost.

**Comment:** I'd like to know if EPA is admitting that the current cleanup standards are inadequate to protect all of West Dallas, since you're going to make that difference in the OU 3, which had the same RS status evaluation that OU 1 had and the same material, the same chips, the same slag requires a different set of standards than it did in OU 1. OU 3 is getting preferential treatment. Would you give us what factor specifically that OU 3 has in it that make it different from OU 1?

**Response:** OU No. 3 is not getting preferential treatment. The cleanup levels for OU 3 are higher than or equal to the cleanup levels for OU 1, which are the lowest levels used at the RSR Site. OU No. 3 was evaluated the same way that OUs 1, 2, 4, and 5 have been evaluated. OUs 1 and 2 were evaluated as residential areas and OUs 4 and 5 were evaluated as industrial areas. EPA is doing the same for the three sites of OU No. 3. Site 1 of OU No. 3 was evaluated as a residential area, the same as for OUs 1 and 2. Sites 3 and 4 were evaluated as commercial areas, the same as for OUs 4 and 5. The standards used for all of the operable units are protective of human health and the environment and are consistent with the cleanup standards

that were used for each operable unit based on either residential use or commercial use. There are significant differences between Sites 3 and 4 of OU No. 3 and OU 1, including the absence of residences and the presence of landfills on Sites 3 and 4 of OU 3.

**Comment:** I am trying to see if you're going to zone OU 3 and its various sites as either commercial or industrial, other than residential, what was the reason OU 1 wasn't given that preferential treatment?

**Response:** First of all, EPA does not have the authority to make zoning decisions. Zoning decisions are made by the city. Generally, EPA considers anticipated future land use in determining clean up levels. At the RSR Site, OUs 1 and 2 are zoned residential by the City of Dallas, and they are currently used as residential areas. EPA assumed that the residential use of those areas would continue in selecting its remedy and cleanup levels for OUs 1 and 2. OUs 4 and 5, on the other hand, are currently zoned by the City of Dallas as commercial/industrial areas, and they are currently occupied by commercial/industrial facilities. EPA assumed that the commercial/industrial use of OUs 4 and 5 would continue in selecting its remedy and cleanup levels for those OUs. OU 3 Site 1 is currently zoned by the City of Dallas as residential, although it is not currently being used as a residential area. Since OU 3 Site 1 appears to be suitable for future residential use consistent with its zoning, EPA assumed that it would be used as a residential area in selecting the remedy and cleanup level for Site 1. OU 3 Site 3 is currently zoned by the City of Dallas as commercial/industrial. Since OU 3 Site 3 appears to be suitable for future use consistent with its zoning, EPA assumed that it would be used for commercial/industrial purposes in selecting the remedy and cleanup levels for OU 3 Site 3. OU 3 Site 4 is currently zoned by the City of Dallas as residential. Site 4 is not currently occupied by residences, and it does not appear to be appropriate for future use as a residential area due to the presence of the landfill materials on the site. EPA, therefore, assumed that the future use of OU 3 Site 4 would be non-residential (commercial/industrial) rather than residential for purposes of selecting the remedy and cleanup levels for OU 3 Site 4. It should be noted that EPA does not consider a cleanup to commercial/industrial standards "preferential" over a cleanup to residential standards. The residential standards are much lower than the commercial/industrial levels.

**Comment:** I am here as a representative of a property owner in Site 1 of OU No. 3. I am here to generally say we concur with the Preferred Alternative that EPA has dictated so far and are waiting on public comment with one modification, not exception, but modification we would like you to look at. And that is, because you propose to cleanup to residential standards, we know that under the risk-based rules you're going to require deed recordation unless you go further and clean it up to background. Now, that presents some stigma to the property owners and the property value there. As a result we would like the EPA and the TNRCC to consider putting the cleanup of Site 1 into the voluntary cleanup program. Your deed recordation then would need a certificate of completion, and that would result in less stigma being applied to that type of deed recordation. Future owners and lenders of that property would not be liable for the lead and the arsenic and the other constituents on that facility. There is some precedent for this. There's a second Superfund site in South Texas that has had a portion of it placed into the voluntary cleanup program by the EPA with the concurrence of the TNRCC. I don't know if it would mean that you would have to carve this out and off of the NPL list or what EPA requirements you might have. I would be happy to help you research those if it meant that we could put this cleanup of Site 1 into the voluntary cleanup program and obtain as a result the certificates of completion, rather than have to have a deed recordation and a devaluation of that property, which is owned by innocent parties that had nothing to do with the release that's creating the Superfund designation.

**Response:** EPA does not have the authority to place a site in the voluntary cleanup program (VCP). The landowner submits a request to the TNRCC to be placed in the VCP. TNRCC then decides whether to accept the site into the VCP or not. The owner would then be required to submit, for approval, investigation studies, work plans for the conduct of the cleanup, and then conduct the cleanup with TNRCC oversight. Since OU No. 3 is part of a site listed on the NPL, cleanup of the site under the VCP would not relieve the owner of also having to comply with CERCLA cleanup standards. The site in south Texas was accepted into the VCP before the site was proposed to the National Priorities List. If the site makes the NPL, then cleanup of the site under the VCP would also be required to meet CERCLA standards. At this stage of the NPL process, it would not be feasible to carve this site from the rest of the RSR site. Since Site 1 is already part of the NPL, it cannot be

deleted from the NPL before meeting the cleanup standards that are selected in the Record of Decision for the site. To delete a site from the NPL, EPA must determine, in consultation with the State, that one of the following criteria has been met: 1) Responsible or other parties have implemented all response actions required; 2) All appropriate Fund-financed response under CERCLA has been implemented, and no further response action by responsible parties is appropriate; 3) The remedial investigation (RI) has shown that the release poses no significant threat to public health or the environment, and therefore, it is not appropriate to take remedial measures.

Site 1 of OU No. 3 does not meet any of the above criteria and therefore can not be removed from the NPL at this time.

**Comment:** I talked to you at the Multi-purpose Center. The last time we were speaking, we had came up to around about \$5 billion. If the cleanup costs go up to maybe \$5 billion, do you have that to help the blacks and the Hispanics and the low-income people in west Dallas? Would the EPA have this much money to help us?

**Response:** The amount of money the commentor is referring to may be the total amount that is in the Superfund Trust Fund. This money is use to cleanup sites all over the country and is not designated for one site. Superfund money can be used only to conduct the cleanup of hazardous waste sites and certain closely related activities.

**Comment:** The West Dallas site, how much money is the Superfund for the West Dallas site? How much money?

**Response:** EPA has spent approximately \$16 million from the Superfund program to conduct the cleanup of the residential areas and conduct remedial investigations, feasibility studies, and designs for future cleanups. Right now, no new money has been allocated for the cleanup of the remaining operable units. EPA is close to an agreement with some Potentially Responsible Parties to conduct the cleanup of the smelter facility, OU No. 4. As funds are needed in the future, requests will be made to EPA HQs for funding to conduct cleanup activities. EPA is confident that there will be sufficient funds to complete the cleanup activities in west Dallas.

**Comment:** You don't have \$50 million in the Superfund for West Dallas?

**Response:** No, the \$50 million was an estimate of approximately how much money will ultimately may be spent in conducting the cleanup of the five operable units. It is not money that has been set aside for West Dallas.

**Comment:** You cleaned up the residential areas of West Dallas. Where did that money come from? Do you have a receipt or something to show me?

**Response:** EPA spent approximately \$12 million to conduct the cleanup of the residential areas. That money came from the Superfund program and was allocated for the cleanup as needed. I do not have the receipts with me of how that money was spent. Detailed documentation of EPA's costs is available in our office files. Persons who want to look at those files may make a request and an appointment will be set up for them look at that information. We do not carry receipts or site files with us when we conduct public meetings. As we stated in the Proposed Plan those files are available at three repositories for review.

**Comment:** Is there any blacks on the EPA board, a woman or a black man on the EPA board?

**Response:** Yes, EPA Region 6 has an African-American woman serving as Acting Deputy Regional Administrator and an African-American male serving as a Division Director. There are also other women and minorities serving in management positions at EPA Region 6.

**Comment:** I'm a former contaminated resident of West Dallas. I stayed on the lead plant, rather say, not in it. I lived in the lead. I started smoking at a young age, smoking contaminated air. I was drinking the lead-contaminated water. I done ate from the lead soil. But do the EPA compensate or try to help me and my sick kids? No. They're trying to tear down the site, but what about the people that was contaminated in West Dallas? What about the people that walk around with asthma, high blood pressure, all these bad, these things, these illnesses they wouldn't have if they hadn't been contaminated?

**Response:** EPA can not compensate people for health affects or provide health care. The Superfund program is set up to cleanup hazardous waste sites.

**Comment:** I'm a professional biology teacher and a person that came out of this community that knows science and a lead-contaminated person. And I applaud your efforts in cleaning up this cosmetic, because it does look bad on the outside. And money is an important issue, but I know something that's more important than that. It's life, the ability to live life freely, an opportunity to succeed. Now, I realize the capacity of the EPA. It's supposed to be Environmental Protection, that was the key word, Protection Agency. Who are you protecting? Are you protecting the lives of people, or are you protecting the profile of certain people?

**Response:** There are limitations on what EPA can do. EPA is conducting cleanups to protect all of the people living and working in West Dallas.

**2. Letter from Mr. Luis Sepulveda, President West Dallas Coalition for Environmental Justice, dated July 16, 1997.**

**Comment:** What you are doing in west Dallas lead is a joke. Nothing but big joke. Slag still everywhere, dust in homes, chips still in yards. EPA is big joke in our community, barrios. West Dallas will always be big dump. See you in court.

**Response:** The cleanup in west Dallas is certainly not a joke to EPA. Significant man power resources have been dedicated to the cleanup effort in west Dallas and millions of dollars spent since 1991. These efforts are continuing and EPA will invest additional resources to address the lead contamination in west Dallas attributed to the RSR smelter. The proposed plan presented to the public for comment and the decisions contained in this Record of Decision are to address the slag and lead contamination at the three sites that comprise OU No. 3. All areas of west Dallas have benefited in some form through the efforts of EPA's actions taken to address the lead contamination problems. Instead of threatening to see EPA in court, we hope that citizens work with us in addressing the remaining contaminated areas just as other community groups have done in west Dallas in working together in the decisions affecting the cleanup efforts.

3. **Mr. Otis Fagan, Sr., President, Friendship Homeowners Association for Environmental Justice letter dated July 24, 1997.**

**Response:** Comments submitted by Mr. Fagan in a letter dated July 24, 1997, were also made at the public meeting conducted on July 24, 1997. Mr. Fagan's comments and EPA's response to those comments are included above with the minutes of the public meeting

4. **Ms. Jill A. Kotvis, Chair, Environmental Practice Group, letter dated July 31, 1997.**

**Response:** Ms. Kotvis comments submitted in the letter dated July 31, 1997 were also made at the public meeting conducted July 24, 1997. Ms. Kotvis comments and EPA's response to those comments are included above in the public meeting minutes.

5. **Mr. Keith Pate, Consultant - Representing William P. Dorfmeister, Owner of former Dahlstrom Landfill Site, letter dated July 30, 1997**

**Comment:** We appreciated the opportunity to participate in the RSR Corp. Superfund Site Public Meeting on July 24, 1997. We commend both your agency and TNRCC for the work done to date. EPA is very concerned that, to date, no one has been able to get the City of Dallas to the table and participate in the remediation work and costs. Our belief is the City of Dallas is equally responsible and liable along with RSR Corporation for the problem and would expect your agency and TNRCC to immediately take any action necessary to force the City of Dallas to share in any and all costs involved.

**Response:** EPA will be pursuing potentially responsible parties (PRPs) to share in the costs associated with EPA's activities conducted for the site. The City of Dallas and others have been identified as PRPs for the site. EPA has notified the City of Dallas of its potential liability for the Site, but the City has thus far not been willing to perform or pay for response actions.

6. **From Ms. Alice Coleman, letter received August 1, 1997.**

**Comment:** I think that they should help people with their health problems. People are sick from inhaling lead,

including myself. I'm on medication for the rest of my life. The Superfund system shouldn't only go towards cleanup, but also for the people health.

**Response:** The EPA Superfund Program was established to cleanup abandon hazardous waste sites that pose a risk to human health and the environment. There are other local, state, and federal agencies that are available to assist people with health problems. EPA also can not compensate people for past health affects.

7. **Comments of the RSR Corporation on EPA's Proposed Plan for Operable Unit No. 3, "RSR Corporation" Superfund Site, Dallas, Texas, letter dated August 4, 1997.**

**Comment:** RSR believes that EPA has over stated or mischaracterized the risks associated with OU 3. EPA's failure to properly characterize the risks from current and future site conditions is inconsistent with the National Contingency Plan (NCP). As such, EPA cannot support its preferred remedial alternatives for OU No. 3.

**Response:** EPA did not overstate or mischaracterized the risk associated with OU No. 3. EPA's assessment of the site is consistent with the NCP and comprehensive investigations were conducted at each of the three (3) sites that comprise OU No. 3 to determine the risk at each site. The remedial investigation and human health risk assessment conducted for the site are the basis for preparing the feasibility study which evaluates alternatives to address contaminated areas that exceed human health levels. We have numerous reports and documents to support EPA's preferred remedial alternatives for OU No. 3 presented in the Proposed Plan for the site.

**Comment:** EPA Has Mischaracterized the Risk at OU No 3.

The NCP requires EPA to conduct a "site specific baseline risk assessment" to develop "reasonable maximum estimates of exposure from both current land use conditions and potential future use conditions at each site." Thus, the assessment must "characterize the current and potential threats to human health and the environment that may be posed by contaminants migrating to ground water or surface water, releasing to air, leaching through soil, remaining in the soil, and bioaccumulating in the food chain," in order to "help establish acceptable exposure levels for use in developing remedial alternatives in the FS (Feasibility

Study)."

EPA's Baseline Human Health Risk Assessment for OU No. 3 (risk assessment) purportedly shows that the existing soils, battery cases, and slags located in the landfills (Sites 1, 3, and 4) at OU No. 3 present unacceptable risks for exposure to lead and arsenic to residents, incidental trespassers, and workers. However, EPA's Risk Assessment significantly overstates the risk associated with these metals.

The central flaws in EPA's risk assessment are that it is derived from inappropriate and overly conservative estimates and assumptions on the health impacts of lead and arsenic from Sites 1, 3, and 4 at OU No. 3. EPA admits as much, when it states in the Feasibility Study that the "HHRA (Human Health Risk Assessment) is subject to uncertainty from a variety of sources including the following: Sampling, analysis, and data evaluation; Fate and transport estimation; Exposure estimation; Toxicological data; and Blood-lead models."

These uncertainties (errors) and particularly apparent in EPA's estimation of the number of children that would have blood leads exceeding 10 ug/dl at Site 1 of OU No. 3. There, EPA has predicated the geometric mean blood-lead concentration to be 41 ug/dl with an estimated 99 percent of the exposed population expected to exhibit blood-lead concentration greater than 10 ug/dl based on soil lead concentrations measured in Site 1.

These risk "estimates" are pure speculation. First, it is generally recognized that the Integrated Exposure Uptake Bio-Kinetic Model (IEUBK Model) fails to accurately predict the number of children with blood lead levels over 10 ug/dl. This is because the IEUBK Model uses overly conservative assumptions and fails to account for non-soil exposure sources. Without the use of accurate assumptions as well as the measurement of non-soil exposures, the IEUBK Model cannot accurately predict children's blood lead levels from soil exposure.

Second, EPA, in this case, failed to use site specific intake absorption parameter because "site specific values [were] not available." Thus, EPA relied upon the Model's overly conservative default values. Given the inaccessibility of Site 1 (most of it is fenced off) as well as the fact that much of the materials present at Site 1

(e.g., slag, battery casing chips and municipal debris) are not readily bioavailable, EPA's estimations of the amount of soil intake and absorption are very likely to be overstated. EPA admits as much in the Feasibility Study by stating that "[r]isks may be overestimated . . . if characteristics of the exposed population at the site differ from these default assumptions."

Third, EPA's estimates from the IEUBK Model are clearly at odds with the results of a recent public health assessment performed at the so-called RSR Site by the Texas Department of Health. That assessment, performed on children living in near proximity to the so-called RSR Site, found that the average blood lead level of children was 5.5 ug/dl. This figure is well below the Centers for Disease Control 10 ug/dl level of concern and almost a level of magnitude less than EPA's estimate. The Texas Department of Health study further concluded the "blood lead levels were not substantially different among West Dallas children and children from other parts of Dallas."

In short, it would be arbitrary and capricious for EPA to base its remedial action decision as to this Operable Unit on a default-assumption-based IEUBK model run.

EPA also overstates the risks posed by arsenic in the soils of Sites 1, 3, and 4 at OU No. 3. This is largely because EPA's risk assessment assumes that arsenic in soils is completely (100%) bioavailable. This is not so. The bioavailability of arsenic in soil is the product of solubility and absorption. It is influenced by chemical species, soil particle size, associated soil matrix materials (solubility-related factors), the mode of intake, and host factors such as nutritional status (absorption-related factors).

Those studies that have evaluated the bioavailability of arsenic in soils from smelter sites have concluded that arsenic in soils is not more than 20% bioavailable, depending upon the soil matrix. For example, the attached study performed by G.B. Freeman on the bioavailability of arsenic in soils impacted by smelter activities administered to monkeys found that arsenic was at most 20% bioavailable. Another study performed by Greon, et al., on the bioavailability of arsenic in soils also concluded that arsenic from soil was relatively unbioavailable. That study found that the bioavailability of arsenic from ore-containing soil was 8.3%. In short, arsenic risks at this

Operable Unit also have been significantly overstated by EPA.

**Response:** The uncertainties that EPA listed in the HHRA are just that "uncertainties" which are unknowns and not "errors" or mistakes as the commentor implies by including the word "errors" after the word "uncertainties" in the comment. These uncertainties or unknowns could result in the risk assessment being overestimated or underestimated. In this case, EPA chose the most conservative results to ensure protection of human health based on long term exposure to site contaminants, especially exposure to children who are the most sensitive population to contaminants.

The risk estimates are just that, estimates and not speculation as the commentor states. These estimates are based on a model (IEUBK) that is used nationally to predict blood lead levels. The model is widely used by other Federal and State agencies to predict blood lead levels for children exposed to lead contaminants. The model uses site specific data (when available) for input to the model and default parameters when site specific data is not available. This was done for the OU No. 3 sites.

OSWER Directive # 9355.4-12. Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities, 1994 states "The IEUBK Model for Lead in Children was developed to: recognize the multimedia nature of lead exposures; incorporate important absorption and pharmacokinetic information; and allow the risk manager to consider the potential distributions of exposure and risk likely to occur at a site (the model goes beyond providing a single point estimate output). For these reasons, this approach is judged to be superior to the more common method for assessing risks of non-cancer health effects which utilizes the reference dose (RfD) methodology . . . The Agency believes that the IEUBK is the best available tool currently available for assessing blood lead levels in children. Furthermore, use of the IEUBK allows the risk manager to consider site-specific information that can be very important in evaluating remediation options."

The model has received extensive peer review from both the Science Advisory Board and the Technical Review Workgroup for Lead. In July of 1992, the Office of Solid Waste and Remedial Response (OSWER) convened a meeting to solicit comments on the original Uptake/Biokinetic (UBK) model from

a wide range of interests, including environmental groups, citizens, and lead industry representatives, and incorporated comments from these groups into the current IEUBK model. In 1994, EPA outlined its strategy for IEUBK model validation. Validation was carried out with existing data sets relating environmental and blood lead levels on a per individual basis by using the IEUBK model to generate blood lead predictions from the measured environmental lead levels. These predicted lead levels were then compared with the measured blood levels, using geometric mean blood levels and proportions observed or expected to have elevated blood lead levels. All studies used for the validation exercise had data of sufficient quality and quantity to characterize the environmental lead levels in each residential home and yard (i.e., blood lead levels of residents, as well as soil, dust water, interior and exterior lead paint levels, and demographic/behavioral survey data covering other aspects of lead exposure). The modeled results and observed blood lead levels were reasonably concordant, with similar geometric mean predicted and observed blood lead concentrations ( $5.81 \mu\text{g/dl}$  versus  $5.44 \mu\text{g/dl}$ , respectively) and similar population proportions with elevated blood lead levels.

Although comparisons of IEUBK model output to empirical blood lead data cannot provide conclusive "verification" of the model, they can contribute to an overall evaluation of the credibility of model predictions. Results of EPA's validation exercises provide confidence that the IEUBK model is a credible predictor of blood lead levels in environmentally exposed children.

The commentor states that the IEUBK Model "fails to account for non-soil exposure sources". That is not the case since input parameters for the model include soil, air, and water sources and soil dust/lead paint ratios. So, clearly the model takes into account other sources than just soil. Site specific data for the other parameters was taken from the measurements made for the OU No. 1 study conducted for the residential areas of west Dallas. OU No. 3 is located within the west Dallas residential area.

The commentor quotes EPA's statement that "risks may be overestimated," but the commentor left out the additional statement that EPA made, which was that "the risk may be underestimated." When it comes to protecting human health, especially the health of children, for whom the IEUBK Model is used, EPA has elected to pursue a conservative course. The assumptions made in calculating risk are based on known conditions and predicting future site conditions on best case scenarios.

The public health assessments conducted by the Texas Department of Health (TDH) at the RSR site were based on site specific information for OU No. 1. As the commentor states, the health assessment was performed for children living in near proximity to the RSR Site and was not made for children living on Site 1 of OU No. 3. The commentor implies that the results of the OU No. 1 study would be the same for the OU No. 3 site. The health assessments conducted by TDH are based on conditions after cleanups (conducted by EPA) had been completed. Once the cleanup is completed at Site 1 of OU No. 3, the TDH would probably reach the same conclusion for Site 1 as it did for OU No. 1, but only when the cleanup is completed and not with current conditions.

The arsenic risks have not been overestimated. The smelting process results in the release of inorganic arsenic into the air and in waste forms. It has been documented that in general, inorganic forms of arsenic are more toxic than organic forms. The bioavailability of arsenic is dependent on many environmental factors. The bioavailability of arsenic in some animal studies has been shown to be as much as 50% to 80%. As was the case with lead, EPA chose the most conservative estimates to ensure that human health would be protected even in a worst case situation.

**Comment: Proper Analysis would have Resulted in the Choice of No Action Alternatives**

Had EPA properly characterized the risks posed by lead and arsenic at OU No. 3, the risks associated with Sites 1, 3, and 4 likely would have been found to be well within the NCP's acceptable exposure levels for systemic toxicants and known or suspected carcinogens at Superfund sites. EPA's failure to accurately characterize the risks posed at OU No. 3 thus is inconsistent with the NCP.

Consequently, EPA's risk assessment cannot be used to support EPA remedial action goals, the definition of remedial alternatives, or the choice of the preferred remedial alternatives for Sites 1, 3, and 4 of OU No. 3. Based on the information available to RSR (and referenced in the footnotes to this letter), it seems likely that a no action alternative would be appropriate for Sites 1, 3, and 4. In any event, until EPA's risk assessment is revised to accurately characterize the risk at OU No. 3, no decision on final response actions can lawfully be made.

**Response:** Not only is EPA risk assessment consistent with the NCP, it is also consistent with risk assessments conducted at other similar sites through Region 6 and the rest of the country. Therefore, it is appropriate to use this risk assessment to determine remedial action goals for OU No. 3 and select alternatives that best meet EPA's nine criteria for selecting remedial alternatives at Superfund sites. Additionally, EPA alternatives for the two former landfill sites are consistent with the presumptive remedial alternatives recommended for these sites.

**8. Comments written on behalf of Texas Industries, Inc. ("TXI"), submitted by Hutcheson & Grundy, L.L.P. letter dated August 4, 1997.**

**Comment:** These comments pertain primarily to OU No. 3, Site 3 which consists of three distinct properties where the City of Dallas operated three separate landfills. Given the City's course of conduct in accepting industrial solid wastes at its landfills in violation of express permit and contractual provisions, the investigation conducted by the EPA, as reflected in the RI/FS, may not be sufficient. The EPA has not conducted a complete investigation into the City of Dallas landfill operations covered by OU 3. The EPA has not obtained all of the records available from the City of Dallas related to landfill operations conducted by the City of Dallas and encompassed in OU 3. The extent of the industrial solid wastes accepted by the City of Dallas at the landfills is unclear. Nor does the RI/FS appear to address constituents other than the identified constituents of concern associated with the smelter wastes. Finally, there seems to be a lack of information justifying the parameters of the proposed cover. For instance, the RI/FS does not appear to address the levees in the proposed remedy.

**Response:** EPA conducted a complete investigation to determine the extent to which smelter contaminants may be posing a risk to human health and the environment. It is correct that the focus of the remedial investigations and feasibility study conducted for OU No. 3 was to identify smelter related contaminants. The purpose of the investigations conducted at the site were to identify smelter waste contamination that could be related to the RSR Superfund site. Under the Superfund criteria, areas that contain site related waste become part of the site. In this case, smelter waste materials are present at OU No. 3, and, therefore, OU No. 3 becomes part of the RSR site. Once this was established, the focus of the investigation was conducted to determine the nature and extent of contamination. However, in conducting the remedial investigation at these former landfill sites, EPA used existing guidance for "Conducting Remedial Investigations/Feasibility Studies for CERCLA Municipal Landfill Sites" dated February 1991. Because of the heterogenous nature of the landfill materials, it is almost impossible to fully document all materials or contaminants present in the landfill. The best that can be done is to identify areas or hot spots that pose a risk to human health and the environment. EPA believes that the investigations EPA conducted have done that. The risk assessment conducted for the site did not just consider smelter related contaminants, but also other contaminants identified as a result of the remedial investigation, although the investigation and risk assessment were focused on smelter related waste. The risk assessment indicated that other contaminants were not present above health based levels or that complete exposure pathways existed. The extent of the soil cover or areas to receive a soil cover are based on the risk assessment. The soil cover will be placed over areas or hot spots that exceed health based levels. This is to provide protection to human health and the environment based on current and future industrial use scenarios at these properties. EPA is not sure which levees you are referring to. EPA conducted extensive investigations at each of the three sites that comprise OU No. 3. Old aerial maps were study to determine the approximate limits of the landfill areas, then visual inspections were conducted to determine the presence of battery chips and slag materials, and finally surface samples were collected from the whole site that would be representative of surface conditions and selected subsurface soil samples were also collected and

analyzed for contaminants. If contaminants are present below the levees, they would not present a risk to human health since an exposure pathway would not be present.

**9. Letter from Mr. Bill Dorfmeister**

**Comment:** As a former property owner who never was detrimental in any way to either the property or the environment I would like to see the EPA proceed with vigor against the perpetrators of the problems of sites 1, 2 (3), and 3 (4) and all of the co-conspirators, namely the City and County of Dallas, HB Zachary Co, and RSR Corp and all the executives of the above, both in the criminal and civil courts.

A retaining wall should be built along the creek of Site 3 and charged to Dallas and whomever contracted for closure of the landfill. If the city and the closing contractor don't pay, go after them with much haste and very much vigor.

**Response:** EPA will select a remedial action for OU No. 3 that will be protective of human health and the environment, that is cost effective, and that the community and State support. EPA intends seek to have the responsible parties implement the remedial action and will pursue all reasonable opportunities to recover costs associated with activities conducted at the site.

## Appendix B

### ARARs Analysis

<p align="center"><b>Table A-1</b>  <b>Solid Waste ARARs Evaluation</b>  <b>RSR Corporation Superfund Site OU No. 3</b></p>			Page 1 of 11
<b>Requirement</b>	<b>ARAR?</b>	<b>Justification</b>	
<b>1. Chemical-Specific ARARs</b>			
<b>State</b>			
Groundwater Protection Design and Operation Subchapter H 30 TAC § 330.200(a)(1)	Yes	The requirements specify that new municipal solid waste landfill facility units and lateral expansions need to be designed such that the concentration values listed in Table 2 will not be exceeded in the uppermost aquifer at the relevant point of compliance. The values are relevant and appropriate to OU No. 3.	
Constituents for Detection Monitoring Subchapter I 30 TAC § 330.241	Yes	This section identifies 47 volatile organic chemicals and 15 metals for which detection monitoring is required under 30 TAC § 330.234. Depending on the remedial action selected for the landfills at OU No. 3, this constituent list may be relevant and appropriate.	
<b>1. Action-Specific ARARs</b>			
<b>Federal</b>			
40 C.F.R. Part 241 Guidelines for the Land Disposal of Solid Wastes	Yes	Establishes minimum levels of performance required of any solid waste land disposal site operation. Requirements are relevant and appropriate to conditions at OU No. 3 landfills.	
40 C.F.R. Part 257 Criteria for Classification of Solid Waste Disposal Facilities and Practices	Yes	Establishes criteria for use in determining which solid waste disposal facilities and practices pose a reasonable probability of adverse effects on health or the environment and thereby constitute prohibited open dumps. The landfill cover requirements stated in these regulations are relevant and appropriate to landfills at OU No. 3.	
40 C.F.R. Part 258 Regulations Concerning Municipal Solid Waste Landfills	Yes	Established design and operational criteria for all new municipal solid waste landfills or expansions of existing facilities. The requirements vary depending on the time frame that the land disposal unit is used. The provisions include closure and post-closure care. Landfill cover requirements are relevant and appropriate since waste was not received after October 9, 1991.	

<p align="center"><b>Table A-1</b>  <b>Solid Waste ARARs Evaluation</b>  <b>RSR Corporation Superfund Site OU No. 3</b></p> <p align="right"><b>Page 2 of 11</b></p>		
<b>Requirement</b>	<b>ARAR?</b>	<b>Justification</b>
40 C.F.R. Part 260-261 Identification and Listing of Hazardous Waste	Yes	Defines those solid wastes that are subject to regulation as hazardous wastes under 40 C.F.R. Parts 262-265, and Parts 124, 270, 271. The State of Texas has an approved delegated program for this portion of RCRA. The regulations are applicable for purposes of determining whether any of the materials disposed of are hazardous wastes for purposes of any remedial actions taken under CERCLA. Materials may also be compared to the waste listings to determine whether any of the materials are sufficiently similar such that RCRA regulations are relevant and appropriate.
OSHA Worker Protection 29 C.F.R. 1910.120	Yes	Applicable to OU No. 3 regarding protection of workers at site.
<b>State</b>		
Applicability Subchapter A 30 TAC § 330.3(a) and (b)	Yes	Subsection (a) applies to all persons involved in any aspect of the management and control of municipal solid waste including, but not limited to, storage, collection, handling, transportation, processing and disposal. Subsection (b) notes that for municipal solid waste landfills that stopped receiving waste before October 9, 1991 only the provisions of 30 TAC 330.251 (relating to closure requirements) apply. Both subsections (a) and (b) are applicable. As noted in the following, all other provisions of the regulation are either relevant and appropriate or not ARARs except for closure requirements established under 30 TAC 330.251, 330.254(a), and 330.255.
Permit Required Subchapter A 30 TAC § 330.4(a)	No	Establishes requirements for permits for storage, processing, removal, or disposal of any municipal solid waste. This requirement is not an ARAR as a permit is not required for CERCLA actions.
General Prohibitions Subchapter A 30 TAC § 330.5(a)	Yes	Section (a) specifies that the collection, storage, transportation, processing, or disposal of municipal solid waste, or the use or operation of a solid waste facility to store, process, or dispose of solid waste, in a manner that causes: (1) the discharge or imminent threat of discharge of municipal solid waste into or adjacent to the waters in the state without obtaining specific authorization, (2) the creation and maintenance of a nuisance, or (3) the endangerment of human health and welfare or the environment. This requirement is relevant and appropriate.

<p style="text-align: center;"><b>Table A-1</b>  <b>Solid Waste ARARs Evaluation</b>  <b>RSR Corporation Superfund Site OU No. 3</b></p>			Page 3 of 11
<b>Requirement</b>	<b>ARAR?</b>	<b>Justification</b>	
General Prohibitions Subchapter A 30 TAC § 330.5(e)(1), (e)(4), e(5), e(7), e(8)	Yes	Section (e)(1) prohibits disposal of lead acid storage batteries at municipal solid waste landfills. Section (e)(4) prohibits the disposal of whole used or scrap tires. Section (e)(5) prohibits the disposal of refrigerators, freezers, air conditioners, and any other items containing chlorinated fluorocarbons (CFCs), unless the CFCs have been removed and disposed of at an approved facility. If the CFCs have not been removed, the whole item must be sent to an approved CFC disposal facility. Section (e)(7) prohibits the disposal of regulated hazardous waste as defined in Section 330.2 in a municipal solid waste facility. Section (e)(8) prohibits the disposal of polychlorinated biphenyls in a municipal solid waste facility. All of these provisions are relevant and appropriate to RSR OU No. 3.	
Deed Recordation Subchapter A 30 TAC § 330.7	Yes	Requires that, upon completion of the disposal operation and final closure of the facility or site, that the owner/operator file an "Affidavit to the Public" that restricts the future use of the land in accordance with Section 330.253(e)(8) (Closure Requirements for Municipal Solid Waste Landfill Units that Receive Waste on or after October 9, 1993). This requirement is relevant and appropriate to RSR OU No. 3.	
Types of Municipal Solid Waste Facilities; Subchapter D 30 TAC § 330.41	No	This requirement outlines the classifications of municipal solid waste facilities. This provision is not an ARAR as the landfills located within OU No. 3 are closed and unlikely to reopen.	
Permit Procedures Subchapter E 30 TAC § 330.5	No	This subchapter outlines the permit procedures associated with legally permitting a solid waste management facility. Because no permits are required for actions taken under CERCLA, these provisions are not ARARs for OU No. 3.	
Operational Standards for Solid Waste Land Disposal Sites Subchapter F 30 TAC § 330.100	No	This subchapter establishes requirements for operational procedures including complying with a Site Development Plan, Site Operating Plan, Final Closure Plan, Post-Closure Maintenance Plan, Landfill Gas Management Plan, and all other documents and plans required by this subchapter. These requirements are not ARARs for the RSR OU No. 3 site.	
Access Control Subchapter F 30 TAC § 330.116	Yes	These provisions require that public access be controlled by use of artificial barriers, natural barriers, or both, to protect human health and safety and the environment. These provisions are relevant and appropriate to OU No. 3.	
Disposal of Large Items Subchapter F 30 TAC § 330.124	Yes	Large items (household appliances) should be recycled if they cannot be incorporated into the solid waste operation. The items should be removed from the site to prevent these items from becoming a nuisance and to preclude the discharge of any pollutants from the area. This requirement is relevant and appropriate if remedial actions at the site require some action relative to large items disposed of at the site.	

<p style="text-align: center;"><b>Table A-1</b>  <b>Solid Waste ARARs Evaluation</b>  <b>RSR Corporation Superfund Site OU No. 3</b></p> <p style="text-align: right;"><b>Page 4 of 11</b></p>		
<b>Requirement</b>	<b>ARAR?</b>	<b>Justification</b>
Air Criteria Subchapter F 30 TAC § 330.125	Yes	Requires compliance with the State Implementation Plan regarding releases to air; also requires that ponded water be controlled to avoid development of objectionable odors and requires implementation of appropriate control measures should odors develop. These provisions are relevant and appropriate if remedial actions taken at the site involve disturbances resulting in air releases or situations resulting in ponded water.
Endangered Species Protection Subchapter F 30 TAC § 330.129	No	Prohibits a facility from destructing or modifying the critical habitat of endangered or threatened species, or cause or contribute to the taking of any endangered or threatened species. This requirement is not an ARAR as no critical habitat of endangered or threatened species has been identified at the site.
Landfill Gas Control Subchapter F 30 TAC § 330.130	Yes	Requires that all landfill gases be monitored in accordance with an approved Landfill Gas Management Plan. The provision is relevant and appropriate to landfills on OU No. 3. A Management Plan would not be required under CERCLA, however, the requirements would need to be incorporated to a remedial action.
Abandoned Oil and Water Wells Subchapter F 30 TAC § 330.131	Yes	Requires that all abandoned oil and water wells situated within the site be capped, plugged, and closed in accordance with all applicable rules and regulations. These provisions are relevant and appropriate if abandoned oil and/or water wells are discovered on the OU No. 3 site in the vicinity of the landfills.
Ponded Water Subchapter F 30 TAC § 330.134	Yes	This provision requires action be taken to mitigate ponded water over waste on a solid waste management unit, open or closed. These requirements are relevant and appropriate if ponded water develops at the landfills located in OU No. 3, either before or as a result of any remedial actions.
Disposal of Special Wastes Subchapter F 30 TAC § 330.136	No	Allows disposal of a number of special wastes including dead animals, untreated medical wastes, regulated asbestos-containing material, empty pesticide containers, municipal hazardous waste from a conditionally exempt small quantity generator, used-oil filters, etc. These provisions are not ARARs because the landfills are no longer in operation.
Disposal of Industrial Wastes Subchapter F 30 TAC § 330.137	No	Establishes specific requirements for disposal of Class I industrial solid waste. Not an ARAR for OU No. 3 because the landfills no longer operate and accept waste for disposal.
Operational Standards for Solid Waste Processing, and Experimental Sites Subchapter G 30 TAC § 330.150	No	The landfills associated with OU No. 3 are no longer operational and are not solid waste processing or experimental sites. Provisions in Subchapter G are not ARARs for OU No. 3.

<p align="center"><b>Table A-1</b>  <b>Solid Waste ARARs Evaluation</b>  <b>RSR Corporation Superfund Site OU No. 3</b></p> <p align="right"><b>Page 5 of 11</b></p>		
<b>Requirement</b>	<b>ARAR?</b>	<b>Justification</b>
Groundwater Protection Design and Operation Subchapter H 30 TAC § 330.201	Yes	This section establishes requirements for the use of leachate collection and associated leachate-removal systems for landfills. The provisions specific to leachate collection and removal are relevant and appropriate to the landfills at OU No. 3 in situations where documentation exists to substantiate the generation of leachate.
Groundwater Protection Design and Operation Subchapter H 30 TAC § 330.202 through 330.206	No	The requirements outlined in these sections pertain to construction specifications for liners and location relative to geologic faults. The landfills located in OU No. 3 are no longer operational; consequently these design specifications are not ARARs.
Groundwater Monitoring and Corrective Action Subchapter I 30 TAC § 330.230	Yes	The requirements established for groundwater monitoring are relevant and appropriate to landfills located in OU No. 3. Groundwater monitoring is required throughout the active life and post-closure care period of the municipal solid waste landfill unit.
Groundwater Monitoring Systems Subchapter I 30 TAC § 330.231	Yes	These provisions require installation of a groundwater monitoring system that consists of a sufficient number of wells at appropriate location and depth to yield representative groundwater samples from the uppermost aquifer. This includes installation of background wells. These requirements are relevant and appropriate for the landfills located in OU No. 3.
Groundwater Sampling and Analysis Requirements Subchapter I 30 TAC § 330.233	Yes	Requirements in this section identify data needs associated with groundwater monitoring: water level measurements, sampling and analytical methods, and the associated quality assurance/quality control processes to be used as part of monitoring. These requirements are relevant and appropriate for groundwater monitoring conducted for the landfills at OU No. 3.
Detection Monitoring Program Subchapter I 30 TAC § 330.234	Yes	Based on these provisions, detection monitoring is required at municipal solid waste landfill units from all groundwater monitoring wells. Detection monitoring is required on at least a semiannual basis during the active life of the facility and the closure and post-closure care period. These requirements are relevant and appropriate to the landfills located in OU No. 3.
Assessment Monitoring Program Subchapter I 30 TAC § 330.235	Yes	The provisions adopt 40 CFR Part 258, Appendix II by reference and indicate that if a statistically significant change from background has been detected for one or more constituents listed in 30 TAC § 330.241(d) or an alternative list, that assessment monitoring is required. Depending on the remedial action selected for the landfills located in OU No. 3, these requirements are relevant and appropriate.
Assessment of Corrective Measures Subchapter I 30 TAC § 330.236	Yes	This section identifies the need to evaluate possible corrective action measures for mitigating statistically significant levels of constituents exceeding the groundwater protection standards. Depending on the remedial action selected for the landfills, these requirements are relevant and appropriate.

<p style="text-align: center;"><b>Table A-1</b>  <b>Solid Waste ARARs Evaluation</b>  <b>RSR Corporation Superfund Site OU No. 3</b></p> <p style="text-align: right;"><b>Page 6 of 11</b></p>		
<b>Requirement</b>	<b>ARAR?</b>	<b>Justification</b>
Selection of Remedy Subchapter I 30 TAC § 330.237	Yes	This section outlines the criteria for selecting a remedy in order to satisfy the following: protective of human health and environment; attain groundwater protection standards; control releases so as to reduce or eliminate further releases; and comply with standards for management of wastes as specified in 30 TAC § 330.238(d). These requirements are relevant and appropriate depending on the nature and extent of groundwater contamination attributable to the landfills and depending on the remedial action selected.
Implementation of the Corrective Action Program Subchapter I 30 TAC § 330.238	Yes	This section outlines the criteria for initiation and completion of remedial activities. The requirements are relevant and appropriate in so much that some remedial action is required to address groundwater contamination resulting from the landfills located on OU No. 3.
Groundwater Monitoring at Type IV Landfills Subchapter I 30 TAC § 330.239  Groundwater Monitoring at Other Types of Landfills and Facilities Subchapter I 30 TAC § 330.240	No	Requirements included in these sections address groundwater monitoring at Type IV landfills which include those classified for the disposal of brush, construction-demolition waste, and/or rubbish that are free of putrescible and household wastes, and landfills otherwise not classified as Type I. These requirements are not ARARs for OU No. 3 landfills because the landfills accepted municipal solid waste materials. Groundwater monitoring requirements included elsewhere in Subchapter I are more appropriate to the situation than those specified in this section.
Monitor Well Construction Specifications Subchapter I 30 TAC § 330.242	Yes	Specifications are provided by drilling; casing, screen, filter pack and seals; development; location and elevation; and plugging and abandonment. These specifications are relevant and appropriate in so much as any remedial actions taken at the site require the installation of additional monitoring wells.
Closure Requirements for Municipal Solid Waste Landfill Units That Stop Receiving Waste Prior to October 9, 1991, and Municipal Solid Waste Sites Subchapter J 30 TAC § 330.251	Yes	This section establishes specific procedures and requirements for proper closure. Specific requirements are included for: final cover system; final six inches of cover; side slopes of the final cover; and the schedule for submitting design and specifications for the closure. These requirements are applicable to the landfills at OU No. 3 which stopped receiving wastes prior to the stated deadline. Remedial actions which address cover requirements will need to comply the provisions of this section.

<p align="center"><b>Table A-1</b>  <b>Solid Waste ARARs Evaluation</b>  <b>RSR Corporation Superfund Site OU No. 3</b></p> <p align="right"><b>Page 7 of 11</b></p>		
<b>Requirement</b>	<b>ARAR?</b>	<b>Justification</b>
Closure Requirements for Municipal Solid Waste Landfill Units That Receive Waste on or after October 9, 1991, But Stop Receiving Waste prior to October 9, 1993 and Closure Requirements for Municipal Solid Waste Landfill Units that Receive Waste on or after October 9, 1993, and Municipal Solid Waste Sites Subchapter J 30 TAC §§ 330.252 and 330.253	No	These requirements are not ARARs as the provisions specified in 30 TAC § 330.251 are applicable and address closure requirements specific to the landfill relative to the date of operation and cessation of disposal activities.
Post-Closure Care Maintenance Requirements Subchapter J 30 TAC § 330.254(a)	Yes	Section (a) of this provision applies specifically to post-closure care maintenance requirements for municipal solid waste landfill units closing prior to October 9, 1993 and municipal solid waste sites. Requirements of this section include: retainage of the right-of-way in for a minimum of 5 years; correct cover material and erosion of cover material; and continue monitoring programs implemented during operation. These requirements are applicable to the post-closure care of the landfills located in OU No. 3.
Post-Closure Land Use Subchapter J 30 TAC § 330.255	Yes	These provisions establish limitations on proposed construction activities or structural improvements located on closed municipal solid waste landfill units or municipal solid waste sites. Section (b)(1) of the provisions require that any proposed construction activities or structural improvements not disturb the integrity and function of the final cover, any liner(s), all components of the containment system(s), and any monitoring system(s). These provisions and others included in the citation are applicable to the landfills located in OU No. 3 depending on remedial actions that may be taken that would require disturbance of the in-place systems.
Completion of Post-Closure Care Maintenance Subchapter J 30 TAC § 330.256	No	This section specifies the requirement for submitting documentation verifying the post-closure care maintenance has been completed in accordance with the approved post-closure plan. This requirement is not an ARAR for the landfills located in OU No. 3 because CERCLA actions taken at the site would not require formal certification of completion under this section.

<p align="center"><b>Table A-1</b>  <b>Solid Waste ARARs Evaluation</b>  <b>RSR Corporation Superfund Site OU No. 3</b></p>			Page 8 of 11
<b>Requirement</b>	<b>ARAR?</b>	<b>Justification</b>	
Solid Waste Technician Training and Certification Program Subchapter M 30 TAC §§ 330.381-303.391	No	These provisions deal with procedures for training and certifying landfill operation employees. The requirements provide no substantive requirements relative to CERCLA activities and are therefore not ARARs for OU No. 3.	
Guidelines for Regional and Local Solid Waste Management Plans Subchapter O 30 TAC §§ 330.561-303.568	No	These provisions address the need for regional planning activities for solid waste management purposes. The requirements provide no substantive requirements relative to CERCLA activities and are therefore not ARARs for OU No. 3.	
Fees and Reports for Facilities Subchapter P 30 TAC §§ 330.601-330.700	No	These provisions outline reporting requirements for municipal solid waste landfill units and other related operations. The requirements provide no substantive requirements relative to CERCLA activities and are therefore not ARARs for OU No. 3.	
Memoranda of Agreement and Joint Rules with Other Agencies Subchapter Q 30 TAC §§ 330.701-330.733	No	Provisions included in Subchapter Q address permitting requirements and compliance with regulations enforced by agencies other than TNRCC. The requirements outlined in this Subchapter are administrative and are therefore not ARARs for OU No. 3.	
Management of Whole Used or Scrap Tires Subchapter R 30 TAC §§ 330.801-303.889	No	Subchapter R includes detailed regulations for whole used or scrap tires – generation, storage, and transportation. Provisions included in Subchapter R are not ARARs as the landfills associated with OU No. 3 were not specifically designed nor were operated as tirehandling facilities. Tires observed at the landfills in OU No. 3 were disposed as part of historical practices or as illegally disposed materials (open dumping). Subchapter R does not contain substantive requirements for handling tires disposed of under conditions present at OU No. 3.	
Assistance Grants and Contract Subchapter S 30 TAC §§ 330.890-330.897	No	Subchapter S does not contain substantive requirements related to CERCLA activities associated with the former municipal solid waste landfill operations. The requirements outlined in Subchapter S are administrative and are therefore not ARARs for OU No. 3.	

**Table A-1**  
**Solid Waste ARARs Evaluation**  
**RSR Corporation Superfund Site OU No. 3**

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<b>Requirement</b>	<b>ARAR?</b>	<b>Justification</b>
Management of Whole Used or Scrap Tires or Shredded Tire Pieces Subchapter X 30 TAC §§ 330.900-330.938	No	Tires observed at the landfills in OU No. 3 were disposed as part of historical practices or as illegally disposed materials (open dumping). Subchapter X does not contain substantive requirements for handling tires disposed of under conditions present at OU No. 3.
Use of Land Over Closed Municipal Landfills Subchapter T 30 TAC §§ 330.951-330.963	Yes	These requirements establish standards for development and construction over closed landfills. The rules apply to owners and lessees of property overlying closed landfills, registered professional engineers, local government officials with the authority to disapprove an application for development, developers of property greater than 1 acre, and developers of an enclosed structure greater than 1 acre. Some requirements do not apply to persons constructing or owning single-family homes or duplexes or other enclosed structures. Section 330.953 requires a soil test be performed on land greater than 1 acre to determine if the tract overlies a closed landfill. Section 330.954 establishes permit and registration requirements, procedures and processing. Section 330.955 lists prohibitions for the development of land over a closed municipal solid waste landfill. A developer cannot damage the final cover or the liner without written consent of the executive director unless the damage occurs constructed below the natural grade of the land or the final cover. Sections 330.956 through 330.963 establish procedural requirements relative to permitting, reporting, recordkeeping, and public notifications. The requirements of these provisions are relevant and appropriate for the OU No. 3 if remedial actions undertaken at the landfills require construction of building directly on top of a closed landfill, with the exception of the permitting requirements which would not be ARARs for actions implemented under CERCLA.
Generators of Medical Waste Subchapter Y 30 TAC § 330.1004	Yes	This section establishes standards for generators of medical wastes. These include: record keeping; treatment testing procedures; disposal requirements. Requirements for disposal [1004(d)(4)] is relevant and appropriate for handling and disposal of sharps identified at the landfills at OU No. 3.
Transporters of Medical Waste Subchapter Y 30 TAC § 330.1005	Yes	This section establishes standards for transporters transporting medical wastes to offsite storage, treatment, or disposal facilities. Requirements of this section are relevant and appropriate for medical wastes on OU No. 3 that are sent offsite for disposal.
Disposal of Batteries 30 TAC § 330.1103	Yes	This section specifies that used lead-acid batteries may not be placed with mixed municipal solid waste or otherwise disposed of except as according to these regulations. These requirements are relevant and appropriate to the landfills at OU No. 3 if lead-acid batteries are discovered during the course of CERCLA-related actions at the site.

<p align="center"><b>Table A-1</b>  <b>Solid Waste ARARs Evaluation</b>  <b>RSR Corporation Superfund Site OU No. 3</b></p>			Page 10 of 11
Requirement	ARAR?	Justification	
<b>3. Location Specific</b>			
<b>State</b>			
Easements and Buffer Zones Subchapter F 30 TAC § 330.121	Yes	Prohibits solid waste management activities within easements, buffer zones, or rights-of-way that cross the site; prohibits disposal within 25 feet of the center line of any utility line or pipeline easement without approval. A minimum of 50 feet must be maintained between solid waste processing and disposal activities and the site boundary unless otherwise approved. These requirements are relevant and appropriate if remedial actions at the site require modification or construction related to the landfills.	
Airport Safety Subchapter L 30 TAC § 330.300	No	Specifies necessary actions if landfill units or lateral expansions are located near airport runways under specific operating conditions. Subsection 300(d) of these requirements indicate that disposal of wastes shall not be located in areas where the attraction of birds can cause a significant bird hazard to low-flying aircraft and that all sites within 5 miles of an airport be critically evaluated to determine if an incompatibility exists. These requirements are not ARARs because airport runways are within 5 miles of OU No. 3.	
Floodplains Subchapter L 30 TAC § 330.301	Yes	These provisions apply to new municipal solid waste landfill units, existing units, and lateral expansions located in a 100-year floodplain. These units must not restrict the flow of the 100-year flood, reduce the temporary water storage capacity of the floodplain, or result in washout of solid waste. These provisions are ARARs if remedial activities result in construction or modifications impacting a floodplain.	
Wetlands Subchapter L 30 TAC § 330.302	Yes	These provisions specify that a municipal solid waste landfill unit shall not cause or contribute to significant degradation of wetlands. This includes preventing adverse impacts on fish, wildlife, and other aquatic resources and their habitat from release of the solid waste. Subsection 302(2)(A) through (C) includes requirements that the construction and operation of the landfill unit shall not result in violations of the State waste quality standards, toxic effluent standards of the Clean Water Act, and jeopardize the continued existence of endangered or threatened species or result in loss or destruction of habitat. The requirements under this section are relevant and appropriate; remedial actions taken at the site that impact the wetlands will need to address these requirements.	
Fault Areas Subchapter L 30 TAC § 330.303	No	Specifies design criteria for landfill units within 200 feet of a fault that has had displacement in Holocene time. These requirements are not ARARs as this geologic setting is not present at OU No. 3.	
Seismic Impact Zones Subchapter L 30 TAC § 330.304	No	Restricts the location of new landfill units and lateral expansions in seismic impact zones. This requirement is not an ARAR as seismic impact zones have not been identified at OU No. 3.	

<b>Table A-1</b> <b>Solid Waste ARARs Evaluation</b> <b>RSR Corporation Superfund Site OU No. 3</b>			Page 11 of 11
<b>Requirement</b>	<b>ARAR?</b>	<b>Justification</b>	
Unstable Areas Subchapter L 30 TAC § 330.305	No	Specifies engineering design criteria for landfill units or expansions located in unstable areas. These requirements are not ARARs because unstable areas have not been documented in the OU No. 3 area.	

<b>Table A-2</b> <b>Solid Waste Contaminant-Specific ARARs</b> <b>RSR Corporation Superfund Site OU No. 3</b>	
<b>Parameter</b>	<b>R&amp;A<sup>1</sup></b> <b>(mg/L)</b>
Arsenic	0.05
Barium	1
Benzene	0.005
Cadmium	0.01
Carbon tetrachloride	0.005
Chromium (hexavalent)	0.05
2,4-D	0.1
1,4-Dichlorobenzene	0.075
1,2-Dichloroethane	0.005
1,1-Dichloroethylene	0.007
Endrin	0.0002
Fluoride	4
Lindane	0.004
Lead	0.05
Mercury	0.002
Methoxychlor	0.1
Nitrate	10
Selenium	0.01
Silver	0.05
Toxaphene	0.005
1,1,1-Trichloroethane	0.2
Trichloroethylene	0.005
2,4,5-T	0.01
Vinyl chloride	0.002
<sup>1</sup> Design Criteria; 30 TAC 330.200; Subchapter H--Groundwater Protection Design and Operation	

<b>Table A-3</b> <b>Solid Waste Contaminant-Specific ARARs</b> <b>Constituents for Groundwater Detection Monitoring</b> <b>RSR Corporation Superfund Site OU No. 3</b>		
<b>R&amp;A<sup>1</sup></b> <b>Inorganic<sup>a</sup></b> <b>Parameter</b>	<b>R&amp;A<sup>1</sup></b> <b>Organic</b> <b>Parameter</b>	
Antimony	Acetone	trans-1,3-Dichloropropene
Arsenic	Acrylonitrile	Ethylbenzene
Barium	Benzene	2-Hexanone
Beryllium	Bromochloromethane	Methyl bromide
Cadmium	Bromodichloromethane	Methyl chloride
Chromium	Bromoform	Methylene bromide
Cobalt	Carbon disulfide	Methylene chloride
Copper	Carbon tetrachloride	Methyl ethyl ketone
Lead	Chlorobenzene	Methyl iodide
Nickel	Chloroethane	4-Methyl-2-pentanone
Selenium	Chloroform	Styrene
Silver	Dibromochloromethane	1,1,1,2-Tetrachloroethane
Thallium	1,2-Dibromo-3-chloropropane	1,1,2,2-Tetrachloroethane
Vanadium	1,2-Dibromomethane	Tetrachloroethylene
Zinc	o-Dichlorobenzene	Toluene
	p-Dichlorobenzene	1,1,1-Trichloroethane
	trans-1,2-Dichloro-2-butene	1,1,2-Trichloroethane
	1,1-Dichloroethane	Trichloroethylene
	1,2-Dichloroethane	Trichlorofluoromethane
	1,1-Dichloroethylene	1,2,3-Trichloropropane
	cis-1,2-Dichloroethylene	Vinyl acetate
	trans-1,2-Dichloroethylene	Vinyl chloride
	1,2-Dichloropropane	Xylenes
	cis-1,3-Dichloropropene	
<sup>a</sup> Total constituents. Subchapter I--Constituents for Detection Monitoring; 30 TAC 330.241.		

**Table A-4**  
**Soils or Solid Media ARARs**  
**RSR Corporation Superfund Site OU No. 3**

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Requirement	ARAR?	Justification
<b>1. Contaminant-Specific ARARs</b>		
<b>Federal</b>		
Risk-based preliminary remediation goals (PRGs) [Risk Assessment Guidance for Superfund (RAGS), Part B]	TBC	Risk-based PRGs calculated using RAGS Part B are TBC for OU No. 3.
National Contingency Plan 40 C.F.R. Part 300.430(d) Baseline Human Health Risk Assessment	Yes	Applicable to OU No. 3. Evaluates baseline human health risk due to current and potential future site exposures, and establishes contaminant levels in environmental media at the OUs for protection of public health.
Office of Solid Waste and Emergency Response (OSWER) Directive 9355.4-12 July 14, 1994	TBC	The directive establishes soil cleanup levels for lead abatement for residential areas. These levels are TBCs for OU No. 3.
EPA – Strategy for Reducing Lead Exposures, October 3, 1990	TBC	TBC for OU No. 3. The strategy was developed to reduce lead exposures to the greatest extent possible. Goals of the strategy are to: (1) significantly reduce blood lead incidences above 10 µg/dL in children and (2) reduce the amount of lead introduced into the environment.
Class 1 Waste Determination Subchapter R 30 TAC § 335.505	Yes	This section specifies the requirements for identifying if a nonhazardous industrial solid waste is a Class 1 waste, which is defined as a waste that contains specific constituents which equal or exceed the levels listed in Table 5. These provisions are applicable to OU No. 3.
Attainment of Risk Reduction Standard Number 1: Closure/Remediation to Background Subchapter S 30 TAC § 335.554	No	These provisions specify that, to meet Risk Reduction Standard Number 1, closure and/or remediation must meet background levels or practical quantitation limits if the practical quantitation limit exceeds background. These provisions would be relevant and appropriate if Risk Reduction Standard Number 1 were the preferred standard; however, it is unlikely that cleanup goals will be set at background levels.
Attainment of Risk Reduction Standard Number 2: Closure/Remediation to Health/Based Standards and Criteria Subchapter S 30 TAC § 335.555	Yes	Subsection (a) specifies that the concentration of a contaminant in contaminated media of concern such as groundwater, surface water, air or soil shall not exceed the cleanup levels as defined in § 335.556 (relating to Determination of Cleanup Levels for Risk Reduction Standard Number 3). If the practical quantitation limit and/or background concentration is greater than the cleanup level, the greater of the practical quantitation limit or background shall be used for determining compliance with the requirements of this section. These provisions are relevant and appropriate to development of contaminant-specific cleanup goals for OU No. 3.

<p align="center"><b>Table A-4</b>  <b>Soils or Solid Media ARARs</b>  <b>RSR Corporation Superfund Site OU No. 3</b></p>			Page 2 of 11
<b>Requirement</b>	<b>ARAR?</b>	<b>Justification</b>	
<b>1. Contaminant-Specific ARARs (Continued)</b>			
<b>Federal (Continued)</b>			
Determination of Cleanup Levels for Risk Reduction Standard Number 2 Subchapter S 30 TAC § 335.556	Yes	Specifies that for purposes of risk reduction, cleanup levels for individual contaminants are represented by Texas or federal promulgated health-based standards, or when these are not available or do not provide appropriate protection, then cleanup levels based on procedures specified for determining other numeric criteria (Medium-Specific Concentration or MSC) are required to be developed. These provisions are relevant and appropriate to OU No. 3.	
Criteria for Selection of Non-residential Soil Requirements for Risk Reduction Standard Number 2 Subchapter S 30 TAC § 335.557	Yes	Specifies the conditions under which soil requirements can deviate from residential soil requirements. Subsection (1) notes that for property located within the jurisdictional area of a zoning authority, documentation may be provided to demonstrate that the property is zoned for commercial or industrial use. This requirement is relevant and appropriate for OU No. 3 to the extent that current zoning is relied upon to predict future land uses.	
Medium Specific Concentrations for Risk Reduction Standard Number 2 Subchapter S 30 TAC § 335.558	Yes	Subsections (b) through (d) of this section specify the methods for calculating medium specific concentrations for ingestion of surface water and groundwater, and soil ingestion along with inhalation of volatiles and particulates. These provisions are relevant and appropriate to setting contaminant-specific cleanup levels/goals for OU No. 3.	
Medium Specific Requirements and Adjustments for Risk Reduction Standard Number 2 Subchapter S 30 TAC § 335.559	Yes	Subsections (b) through (h) specify requirements that can define or modify numeric cleanup levels such as media-specific concentrations or require non-health based criteria to be addressed. These provisions are relevant and appropriate to establishing cleanup goals for OU No. 3.	
<b>2. Action-Specific ARARs</b>			
<b>Federal</b>			
40 CFR 268 Land Disposal Restrictions	Yes	40 C.F.R. Part 268 establishes restrictions on land disposal of specific wastes unless treatment standards are met. Applicable to OU No. 3, if the wastes are removed from the site for subsequent disposal. Metals wastes in soil that are hazardous by toxicity characteristic are exempt from this rule. The Universal Treatment Standards (UTS) establish a concentration limit for 300 regulated constituents in soil regardless of waste type.	
40 C.F.R. Part 264 Subparts B, C, D and G Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities	Yes	Subparts B, C, and D establish minimum standards which define the acceptable management of hazardous waste for owners and operators of facilities that treat, store, or dispose of hazardous waste. Subpart G establishes standards for closure and post-closure care for site design and operation. These requirements are applicable for wastes identified as RCRA hazardous wastes and relevant and appropriate if sufficiently similar.	

**Table A-4**  
**Soils or Solid Media ARARs**  
**RSR Corporation Superfund Site OU No. 3**

Requirement	ARAR?	Justification
<b>2. Action-Specific ARARs (Continued)</b>		
<b>Federal (Continued)</b>		
40 C.F.R. Part 264 Subparts I and J Standards for Container and Tank Storage of Hazardous Waste	Yes	Subpart I sets operating and performance standards for container storage of hazardous waste. Subpart J outlines similar standards, but applies to tanks rather than containers. These requirements are applicable for RCRA hazardous wastes on OU No. 3 if containers are used for onsite storage of liquids, soil, or other wastes as part of the remedial action, or relevant and appropriate if sufficiently similar.
40 C.F.R. Part 264 Subparts L and N Standards for Waste Piles and Landfills	Yes	Subpart L sets design and operating requirements for the storage or treatment of wastes in piles. If the waste piles are closed with wastes left in place, Subpart L requirements are applicable and must be met. Subpart N establishes construction, design, performance, closure, and operation requirements pertaining to Subtitle C landfills. Subpart L and/or N are applicable for RCRA hazardous wastes on OU No. 3 if onsite treatment, storage, or disposal in piles or Subtitle C landfills is included as part of the remedial action, and relevant and appropriate if sufficiently similar to hazardous waste.
40 C.F.R. Part 264 Subpart S Corrective Action Management Units	Yes	The promulgated portion of Subpart S addresses the corrective action management unit (CAMU) and temporary unit (TU) aspects of RCRA corrective action. A CAMU is a contiguous area within a facility in which remedial wastes generated during corrective action are managed. A CAMU may include uncontaminated areas where necessary to achieve overall remedial goals. Wastes may be moved from one CAMU to another within the facility without triggering land disposal restrictions (LDRs). Wastes can also be removed from the CAMU, treated in a unit, and returned to the CAMU without triggering LDRs. A TU can be used to manage wastes for up to 1 year. TUs are not subject to the full permitting requirements of a fully regulated RCRA unit and waste piles are not eligible for TUs. Subpart S requirements are applicable for RCRA hazardous wastes on OU No. 3 if the remedial action requires wastes to be managed in an onsite CAMU or TU, and relevant and appropriate if sufficiently similar to hazardous waste.
40 C.F.R. Part 264 Subpart X (Miscellaneous Units)	Yes	Relates to "miscellaneous" units that treat, store, or dispose hazardous wastes. Provides general performance standards for location, design, construction, operation, monitoring, and closure/post-closure. This requirement is applicable for RCRA hazardous wastes on OU No. 3 if the remedial action includes onsite treatment, storage, or disposal of waste in a miscellaneous unit, and relevant and appropriate if sufficiently similar to hazardous waste.
40 C.F.R. § 761.60 (PCB Disposal)	Yes	Serves as ARAR for disposal of affected materials containing concentrations of PCBs, if affected materials are identified at OU No. 3. This requirement is applicable.

**Table A-4**  
**Soils or Solid Media ARARs**  
**RSR Corporation Superfund Site OU No. 3**

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Requirement	ARAR?	Justification
<b>2. Action-Specific ARARs (Continued)</b>		
<b>Federal (Continued)</b>		
40 C.F.R. § 761.65(c)(7) (PCB Storage)	No	Serves as an ARAR only to extent that it authorizes storage of liquid PCBs in containers meeting 29 C.F.R. § 1910.106 (OSHA Standards for Flammable and Combustible Liquids); requires preparation and implementation of Spill Prevention Control and Countermeasures plan. Not an ARAR since liquid PCBs were not identified at OU No. 3.
OSHA Worker Protection 29 C.F.R. 1910.120	Yes	Applicable to OU No. 3 regarding protection of workers at site. (29 C.F.R. 1910.120)
Surface Mining Control and Reclamation Act of 1977 25 GSC §§ 1201 <u>et. seq.</u> ; 30 C.F.R. Parts 816.11, .95, .97, .100, and .102	Yes	<p>The requirements include provisions for:</p> <ul style="list-style-type: none"> <li>.11 – Posting signs and markers for reclamation, including top soil markers and perimeter markers.</li> <li>.95 – Stabilization of all exposed surface areas to effectively control erosion and air pollution attendant to erosion.</li> <li>.97 – Use of best technology currently available to minimize disturbances and adverse impacts on fish, wildlife, and related environmental values and achieve enhancement of such if possible.</li> <li>.100 – Contemporaneous reclamation including, but not limited to backfilling, regrading, topsoil replacements and revegetation.</li> <li>.102 – Achieve a post action slope not exceeding angle of repose or such lesser slope as is necessary to achieve a minimum long-term static safety factor of 1.3 and to prevent slides.</li> </ul> <p>These requirements are relevant and appropriate to OU No. 3.</p>
<b>State</b>		
General Prohibitions 30 TAC § 330.5	Yes	The regulation prohibits disposal of lead acid storage batteries at municipal solid waste landfills. This requirement is relevant and appropriate for battery casings identified on OU No. 3.

**Table A-4**  
**Soils or Solid Media ARARs**  
**RSR Corporation Superfund Site OU No. 3**

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Requirement	ARAR?	Justification
<b>2. Action-Specific ARARs (Continued)</b>		
<b>State (Continued)</b>		
Closure and Remediation Subchapter A 30 TAC § 335.8	Yes	These provisions apply to closure and remediation of facilities associated with contamination resulting from unauthorized discharges, either as part of closure or at any time before or after closure. The regulations also apply to remediation of areas that are not otherwise designated as a facility but that contain unauthorized discharges of industrial waste or municipal hazardous waste. Section (a)(2) of this citation specifies that, for remediations performed under the State Superfund program, media cleanup levels should be based on future residential land use unless it is demonstrated that an alternative land use is more appropriate. These requirements are relevant and appropriate for RCRA hazardous wastes on OU No. 3.
Post Closure Care and Deed Certification for Risk Reduction Standard Number 2 Subchapter S 30 TAC § 335.560	Yes	These provisions specify that, upon attainment of Risk Reduction Standard Number 2, a deed recordation be placed in the county using information contained in Subsections (1) through (4). This requirement is relevant and appropriate to OU No. 3 in so much that provisions similar to Risk Reduction Standard Number 2 are applied.
Attainment of Risk Reduction Standard Number 3: Closure/Remediation with Controls Subchapter S 30 TAC § 335.561	Yes	Under Risk Reduction standard Number 3, a remedy must be permanent, or if that is not practicable, achieve the highest degree of long-term effectiveness possible; cost-effective; and achieve media cleanup requirement specified in 30 TAC § 335.563. These provisions are relevant and appropriate to OU No. 3.
Remedy Evaluation Factory for Risk Reduction Standard Number 3 Subchapter S 30 TAC § 335.562	Yes	These provisions outline the evaluation criteria when evaluating the relative abilities and effectiveness of potential remedies to achieve the requirements for remedies described in 30 TAC § 335.562. The evaluation criteria are relevant and appropriate for screening technologies and alternatives is part of the FS for OU No. 3.
Media Cleanup Requirements for Risk Reduction Standard Number 3 Subchapter S 30 TAC § 335.563	Yes	This section specifies the requirements for establishing cleanup levels for air, surface water, groundwater, and soil, including use of media-specific adjustments. The requirements of this section are relevant and appropriate to OU No. 3.
Post closure care not required for Risk Reduction Standard Number 3 Subchapter S 30 TAC § 335.564	Yes	Where it is determined that neither engineering nor institutional control measures are required, no post closure care responsibilities are necessary however deed recordation is required in accordance with 30 TAC § 335.566. This requirement is relevant and appropriate if the conditions are met at OU No. 3.
Shipping and Reporting Procedures Applicable to Generators of Hazardous Waste or Class I Waste and Primary Exporters of Hazardous Waste Subchapter A 30 TAC § 335.10	Yes	Establishes requirements for manifesting shipments of hazardous waste to off-site facilities. This requirement is applicable to OU No. 3 if hazardous or Class I wastes are shipped off-site to a disposal/treatment facility.

**Table A-4**  
**Soils or Solid Media ARARs**  
**RSR Corporation Superfund Site OU No. 3**

Requirement	ARAR?	Justification
<b>2. Action-Specific ARARs (Continued)</b>		
<b>State (Continued)</b>		
Shipping Requirements for Transporters of Hazardous Waste or Class I Waste Subchapter A 30 TAC § 335.11	Yes	Requirements specific to transporters of hazardous or class I wastes regarding manifesting waste shipments. These requirements are applicable to any transporter who transports hazardous or class I wastes offsite from OU No. 3.
Shipping Requirements Applicable to Owners or Operators of Storage, Processing, or Disposal Facilities Subchapter A 30 TAC § 335.12	No	Requires owners or operators of storage, processing or disposal facilities to comply with manifest requirements upon receipt of waste shipment. This requirement is not an ARAR for OU No. 3 because waste shipments will not be received at the RSR Site.
Special Definitions for Recyclable Materials and Nonhazardous Recyclable Materials Subchapter A 30 TAC § 335.17	Yes	Specifies definition of recyclable materials including "scrap metal." This requirement is applicable to OU No. 3 if materials (building components, etc.) are to be recycled.
Requirements for Recyclable Materials and Nonhazardous Recyclable Materials Subchapter A 30 TAC § 335.24 (c) and (h)	Yes	Specifies that scrap metal is not subject to regulation under Subchapter B-I and O of Chapter 335. Under § 335.24(h), the rule specifies that scrap metal, as defined in Section (c) remains subject to the requirements of § 335.4 (relating to General Prohibitions) and § 335.6 (relating to Notification Requirements). Such waste may also be subject to the requirements of § 335.10 through § 335.15 of Title 30.  These requirements are applicable to OU No. 3 if scrap metal materials are recycled.
Adoption of Appendices by Reference Subchapter A 30 TAC § 335.29	Yes	Adopts appendices contained in 40 C.F.R. Part 261 by reference; this includes Appendix I-III, VII-X.  I - Representative Sampling Methods II - Method 1311 Toxicity Characteristic Leaching Procedure III - Chemical Analysis Test Methods VII - Basis for Listing Hazardous Waste VIII - Hazardous Constituents IX - Wastes Excluded under § 260.20 and § 260.22 X - Method of Analysis for Chlorinated Dibenzo-p-dioxins and Dibenzofurans.  These requirements are applicable for OU No. 3 to determine which, if any, media are RCRA hazardous wastes. These requirements are not applicable since much of the contaminated media was disposed of prior to 1980.

**Table A-4**  
**Soils or Solid Media ARARs**  
**RSR Corporation Superfund Site OU No. 3**

Requirement	ARAR?	Justification
<b>2. Action-Specific ARARs (Continued)</b>		
<b>State (Continued)</b>		
Hazardous Waste Management General Provisions Subchapter B 30 TAC § 335.41	Yes	This subchapter implements a state hazardous waste program which controls from point of generation to ultimate disposal those wastes listed in 40 C.F.R. Part 261. These standards are relevant and appropriate for RCRA hazardous wastes on OU No. 3.
Standards Applicable to Generators of Hazardous Wastes Subchapter C 30 TAC § 335.61, §§ 335.65-335.70	Yes	This subchapter establishes standards for generators of hazardous waste. These standards include: packaging, labeling, marking, placarding, accumulation time, and record-keeping. Requirements for packaging, labeling, marking, and placarding are relevant and appropriate for RCRA hazardous wastes on OU No. 3.
Standards Applicable to Transporters of Hazardous Waste Subchapter D 30 TAC § 335.91	Yes	This subchapter establishes standards for transporters transporting hazardous waste to offsite storage, processing, or disposal facilities. This subchapter does not apply to onsite transportation of hazardous waste by generators or by owners or operators of storage, processing, or disposal facilities.  Requirements of this subchapter are applicable for RCRA hazardous wastes on OU No. 3 that are sent offsite for disposal.
Applicability of Groundwater Monitoring and Response Subchapter F 30 TAC § 335.156	Yes	This section outlines the rules pertaining to groundwater monitoring and response, which apply to owners and operators of facilities that process, store, or dispose of hazardous waste. The owner or operator must satisfy the requirements of § 335.156 (a)(2) for all wastes (or constituents thereof) contained in any such waste management unit at the facility, regardless of the time at which waste was placed in the units.  These requirements are relevant and appropriate for RCRA hazardous wastes left in place or disposed on OU No. 3.
Required programs Subchapter F 30 TAC § 335.157	Yes	Requires owners and operators subject to 30 TAC § 335.156 to conduct a monitoring and response program as follows:  (1) Whenever hazardous constituents from a regulated unit are detected at the compliance point, the owner or operator must institute a compliance monitoring program. (2) Whenever the groundwater protection standard is exceeded, the owner or operator must institute a corrective action program. (3) Whenever hazardous constituents from a regulated unit exceed concentration limits under § 335.160 in groundwater between the compliance point and the downgradient facility boundary, the owner or operator must institute a corrective action program, and (4) In all other cases, the owner or operator must institute a detection monitoring program.  These requirements are relevant and appropriate for RCRA hazardous wastes left onsite at OU No. 3.

**Table A-4**  
**Soils or Solid Media ARARs**  
**RSR Corporation Superfund Site OU No. 3**

Requirement	ARAR?	Justification
<b>2. Action-Specific ARARs (Continued)</b>		
<b>State (Continued)</b>		
Interim Standards for Owners and Operators of Hazardous Waste Storage, Processing, or Disposal Facilities Subchapter E 30 TAC § 335.111	Yes	This subchapter establishes minimum requirements that define the acceptable management of hazardous waste prior to the issuance or denial of a hazardous waste permit and until certification of final closure or, if the facility is subject to post-closure requirements, until post-closure responsibilities are fulfilled.  These requirements are relevant and appropriate for RCRA hazardous wastes on OU No. 3 if wastes are left onsite.
Interim Standards for Owners and Operators of Hazardous Waste Storage, Processing, or Disposal Facilities-Standards Subchapter E 30 TAC § 335.112	Yes	Adopts 40 C.F.R. Part 265, except as noted, by reference. This includes Subparts B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, W, AA, and BB.  These requirements are relevant and appropriate for RCRA hazardous wastes on OU No. 3 if wastes are left onsite.
Containment for Waste Piles Subchapter E 30 TAC § 335.120	Yes	Establishes requirements for hazardous leachate or run-off from a pile: 1) the pile must be placed on an impermeable base, must include a run-on control system and a run-off management system and 2) the pile must be managed such that it must be protected from precipitation and run-on and no liquids or wastes containing free liquids may be placed in the pile.  These requirements are applicable for RCRA hazardous wastes on OU No. 3 if waste piles are created during remediation.
Permitting Standards for Owners and Operators of Hazardous Waste Storage Processing or Disposal Facilities Subchapter F 30 TAC § 335.151	Yes	Subchapter F includes the minimum standards of operation for all aspects of the management and control of municipal hazardous waste and industrial solid waste, including rules relating to the siting of hazardous waste facilities. Permit not required, however, substantive portions must be met.  These standards are relevant and appropriate for RCRA hazardous wastes on OU No. 3.
Standards Subchapter F 30 TAC § 335.152	Yes	Adopts by reference the regulations contained in 40 C.F.R. Part 264, except as noted in this section. These standards are ARARs for RCRA hazardous wastes on OU No. 3.
Corrective Action for Solid Waste Management Units Subchapter F 30 TAC § 335.167(b) and (c)	No	Outlines requirements for corrective action at solid waste management units. No solid waste management units have been identified at OU No. 3. These standards are not ARARs because no regulated units have been established at OU No. 3.

<p align="center"><b>Table A-4</b>  <b>Soils or Solid Media ARARs</b>  <b>RSR Corporation Superfund Site OU No. 3</b></p>			Page 9 of 11
Requirement	ARAR?	Justification	
<b>2. Action-Specific ARARs (Continued)</b>			
<b>State (Continued)</b>			
Design and Operating Requirements (Waste Piles) Subchapter F 30 TAC § 335.170	Yes	Establishes requirements for waste piles including: 1) a liner designed, constructed, and installed to prevent any migration of wastes out of the pile and 2) a leachate collection and removal system immediately above the liner that is designed, constructed, maintained, and operated to collect and remove leachate from the pile.  These requirements are applicable for RCRA hazardous wastes on OU No. 3 if waste piles are created during remediation.	
Location Standards for Hazardous Waste Storage, Processing, or Disposal Subchapter G 30 TAC § 335.201 (a)(3)	Yes	This subchapter establishes minimum standards for the location of facilities used for the storage, processing, and disposal of hazardous waste. The requirements are applicable for any facility built onsite to store, process, or dispose of RCRA hazardous wastes.	
Prohibition on Open Dumps Subchapter I 30 TAC § 335.302	Yes	Prohibits open dumping of industrial solid waste. Applicable to remedial actions at OU No. 3.	
Hazardous Waste Generation, Facility, and Disposal Fees System Subchapter J 30 TAC § 335.321	No	Establishes an industrial solid waste and hazardous waste fee program which is an administrative requirement. Administrative requirements are not ARARs.	
Hazardous Substance Facilities Assessment and Remediation Subchapter K 30 TAC § 335.341 (b)(4)	Yes	Outlines the scope and requirements associated with the State Superfund program, including: ranking of facilities (§ 335.343), delisting and modifications (§ 335.344), removal actions and preliminary site investigations (§ 335.346), general requirements for a remedial investigation/feasibility study (§ 335.348), and general requirements for a remedial action (§ 335.349). The requirements set forth in the rule are relevant and appropriate. However, because the RSR Site is proposed for listing on EPA's National Priorities List and is an EPA-lead Superfund site, the requirements are being met through the CERCLA RI/FS process.	
Specific Air Emission Requirements for Hazardous or Solid Waste Management Facilities Subchapter L 30 TAC § 335.367	Yes	Requires hazardous or solid waste management facilities to use the best available control technology to control emission of air contaminants, considering technical practicability and economic factors. Requires the owner/operator to demonstrate that the facility or unit will not cause or contribute to air pollution. These requirements are relevant and appropriate to RCRA facilities constructed onsite at OU No. 3.	
Pre-Application Review and Permit Procedures Subchapter M 30 TAC § 335.391-335.393	No	These requirements are administrative requirements. Administrative requirements are not ARARs.	

**Table A-4**  
**Soils or Solid Media ARARs**  
**RSR Corporation Superfund Site OU No. 3**

Requirement	ARAR?	Justification
<b>2. Action-Specific ARARs (Continued)</b>		
<b>State (Continued)</b>		
Land Disposal Restrictions Subchapter O 30 TAC § 335.431	Yes	These provisions adopt 40 C.F.R. Part 268 by reference and are applicable for OU No. 3 if wastes are removed from the site for subsequent disposal. The Universal Treatment Standards adopted by Subchapter O establish a concentration limit for 300 regulated constituents in soil regardless of waste type.
Warning Signs for Contaminated Areas 30 TAC Subchapter P § 335.441	Yes	Provides standards and procedures for the placement of warning signs on property contaminated with hazardous substances when such contamination presents a danger to public health and safety. The requirements in Subchapter P are relevant and appropriate for RCRA hazardous wastes on OU No. 3.
Pollution Prevention Source Reduction and Waste Minimization Subchapter Q 30 TAC § 335.473	No	Applies to all large quantity generators, all generators other than large quantity and conditionally exempt generators, and all persons subject to reporting requirements under SARA 313 Title III. The RSR Site is not a large-quantity generator. Therefore, these requirements are not ARARs for OU No. 3.
Waste Classification and Waste Coding Required Subchapter R 30 TAC § 335.503	Yes	These requirements specify the classification scheme and coding for all industrial solid and municipal hazardous waste generated, stored, processed, transported, or disposed of in the site. These requirements are relevant and appropriate for all waste at OU No. 3.
Hazardous Waste Determination Subchapter R 30 TAC § 335.504	Yes	Requires waste generator to determine if the waste is hazardous either as a listed or characteristic waste according to 40 C.F.R. Part 261, Subpart D or 40 C.F.R. Part 261 Subpart C. These requirements are applicable for identifying RCRA hazardous waste at OU No. 3.
Class 1 Waste Determination Subchapter R 30 TAC § 335.505	Yes	Specifies the chemical/physical properties associated with a Class 1 non-hazardous industrial solid waste. This requirement is applicable for OU No. 3 relative to waste determination procedures.
Class 2 Waste Determination Subchapter R 30 TAC § 335.506	Yes	Requires determination of a Class 2 waste classification for industrial solid waste that is neither a hazardous waste, a Class 1 waste, nor a Class 3 waste. This requirement is applicable for OU No. 3.
Class 3 Waste Determination Subchapter R 30 TAC § 335.507	Yes	Specifies that industrial solid waste is a Class 3 waste if it is inert, essentially insoluble, neither a Class 1 nor hazardous waste, and poses no threat to human health and/or the environment. This requirement is applicable for OU No. 3.

**Table A-4**  
**Soils or Solid Media ARARs**  
**RSR Corporation Superfund Site OU No. 3**

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Requirement	ARAR?	Justification
<b>2. Action-Specific ARARs (Continued)</b>		
<b>State (Continued)</b>		
Classification of Specific Industrial Solid Wastes Subchapter R 30 TAC § 335.508(l)	Yes	Section (2) establishes requirements for empty containers; section (3) provides the classification criteria for paper, cardboard, food wastes, and general plant trash; Section (4) specifies that medical wastes subject to the provisions of Chapter 330 shall be designated as Class 2 wastes; and Section (7) mandates that wastes generated by the mechanical shredding of automobiles, appliances, or other items of scrap, used or obsolete metals shall be handled according to the provisions set forth in Texas Solid Waste Disposal act, the Health and Safety Code (§ 361.019) until specific standards are developed for the classification of this waste and adequate disposal capacity is assured. Applicable to OU No. 3 due to open dumping that has occurred at OU No. 3 which includes empty containers, general trash, and medical wastes.
TNRCC Historically Contaminated Sites: Industrial Versus Municipal Solid Waste July 12, 1994	TBC	<p>In an interoffice memorandum, TNRCC established requirements that, before the final deposition of a waste is carried out, the site owner or operator must accomplish at least the following:</p> <ol style="list-style-type: none"> <li>1. Waste type determination (municipal or industrial) and</li> <li>2. Hazardous waste determination in accordance with 30 TAC § 335.62</li> </ol> <p>Wastes from a presently inactive facility (generator) where previous industrial activities occurred or industrial waste was generated, would be classified as industrial waste.</p> <p>As nonpromulgated guidelines, these requirements are TBCs for OU No. 3.</p>
<b>3. Location-Specific ARARs</b>		
<b>Federal</b>		
Coastal Zone Management Act 16 U.S.C. § 1451 <u>et seq.</u> 40 C.F.R. § 6.302(d)	No	Requires assessment of the impacts of activities on a coastal zone and the conduct of activities in connection with a coastal zone in accordance with a state approved Coastal Zone Management Plan. Activities at OU No. 3 will not impact a coastal zone; therefore this requirement is not an ARAR.
40 C.F.R. § 264.18 (Location Standards)	No	Relates to hazardous waste treatment, storage, or disposal facilities subject to permitting. Requires that new units where treatment, storage, or disposal of hazardous waste will be conducted be located greater than 200 feet from a fault with displacement in Holocene time and that facilities located in 100-year floodplains be designed, constructed, and operated to prevent washout of hazardous waste from active portions of the facility. Since the site is not in a 100-year floodplain, this regulation is not an ARAR. The site is not within 200 feet of a fault, thus the provisions pertaining to faults are not ARARs.

<b>Table A-5</b> <b>Soils or Solid Media Waste Contaminant-Specific ARARs</b> <b>Maximum Leachable Concentrations</b> <b>Subchapter R Waste Determination</b> <b>RSR Corporation Superfund Site OU No. 3</b>	
<b>Parameter</b>	<b>Concentration (mg/L)</b>
Acetone	400
Acetonitrile	20
Acetophenone	400
Acrylamide	0.08
Acrylonitrile	0.6
Aniline	60
Antimony	1
Arsenic	1.8
Barium	100
Benzene	0.5
Benzidine	0.002
Beryllium	0.08
Bis(2-chloroethyl)ether	0.3
Bis(2-ethylhexyl)phthalate	30
Bromodichloromethane	0.3
Bromomethane	5
Butylbenzyl phthalate	700
Cadmium	0.5
Carbon disulfide	400
Carbon tetrachloride	0.5
Chlordane	0.03
Chlorobenzene	70
Chloroform	6
2-Chlorophenol	20
Chromium	5
m-Cresol	200
o-Cresol	200
p-Cresol	200
Cyanide	70
DDD	1
DDE	1
DDT	1
Dibutyl phthalate	400
1,4-Dichlorobenzene	7.5
3,3-Dichlorobenzidine	0.8
1,2-Dichloroethane	0.5
Dichlorodifluoromethane	700
1,1-Dichloroethylene	0.6
1,3-Dichloropropene	1
2,4-Dichlorophenol	10
2,4-D	10
Dieldrin	0.02

<b>Table A-5</b> <b>Soils or Solid Media Waste Contaminant-Specific ARARs</b> <b>Maximum Leachable Concentrations</b> <b>Subchapter R Waste Determination</b> <b>RSR Corporation Superfund Site OU No. 3</b>	
<b>Parameter</b>	<b>Concentration (mg/L)</b>
Diethyl phthalate	3,000
Dimethoate	70
m-Dinitrobenzene	0.4
2,4-Dinitrophenol	7
2,4-Dinitrotoluene	0.13
1,4-Dioxane	30
Diphenylamine	90
1,2-Diphenylhydrazine	0.4
Disulfoton	0.1
Endosulfan	0.2
Endrin	0.02
Epichlorohydrin	40
Ethylbenzene	400
Ethylene dibromide	0.004
Heptachlor	0.008
Heptachlor epoxide	0.04
Hexachlorobenzene	0.13
Hexachloro-1,3-butadiene	0.4
Hexachlorocyclopentadiene	20
Hexachloroethane	3
Hexachlorophene	1
Isobutyl alcohol	1,000
Isophorone	90
Lead	1.5
Lindane	0.3
Mercury	0.2
Methacrylonitrile	0.4
Methomyl	90
Methoxychlor	10
Methyl ethyl ketone	200
Methyl isobutyl ketone	200
Methylene chloride	50
Methyl parathion	0.9
Nickel	70
Nitrobenzene	2
N-Nitroso-di-n-butylamine	0.06
N-Nitrosodiphenylamine	70
N-Nitrosomethylethylamine	0.02
N-Nitroso-n-propylamine	0.05
Parathion	20
Pentachlorobenzene	3
Pentachlorophenol	100

<b>Table A-5</b> <b>Soils or Solid Media Waste Contaminant-Specific ARARs</b> <b>Maximum Leachable Concentrations</b> <b>Subchapter R Waste Determination</b> <b>RSR Corporation Superfund Site OU No. 3</b>	
<b>Parameter</b>	<b>Concentration (mg/L)</b>
Phenol	2,000
Pyridine	4
Selenium	1
Silver	5
Styrene	700
1,1,1,2-Tetrachloroethane	10
1,1,2,2-Tetrachloroethane	2
Tetrachloroethylene	0.7
Toluene	1,000
Toxaphene	0.3
trans-1,3-Dichloropropene	1
1,2,4-Trichlorobenzene	70
1,1,1-Trichloroethane	300
Trichloroethylene	0.5
1,1,2-Trichloroethane	6
Trichlorofluoromethane	1,000
2,4,5-TP	1
Vinyl chloride	0.2
Xylenes	7,000

<b>Table A-6</b> <b>Soil/Solid Media Contaminant-Specific APARs</b> <b>RSR Corporation Superfund Site OU No.3</b>								
Chemical	1 R&A Residential (mg/kg)	a,b,c	1 R&A Industrial (mg/kg)	a,c,d	2 TBC Residential (mg/kg)		2 TBC Industrial (mg/kg)	3 A (mg/L)
<b>Inorganics</b>								
Antimony	110.		818		110		818	
Arsenic	0.366		3.27		0.366		3.27	5
Barium	19,100		137,000		19,195		142,476	100
Beryllium	0.149		1.33					
Cadmium	137		1,020		274		2,044	1
Chromium	391		5,110		938		1,577	5
Cobalt								
Copper					10,154		75,628	
Lead	500	e	1,000	e	540	k	2000	5
Manganese					37,669		258,711	
Mercury	82.3		613		82.3		613	0.2
Nickel	1,560	f	20,400	f	5,488		40,880	
Selenium	1,370		10,220		1,372		10,220	1
Silver	1,370		10,220		1,372		10,220	5
Thallium					21.9		164	
Vanadium					1,921		14,308	
Zinc					82,330		613,200	
<b>Organics</b>								
1,1,1-Trichloroethane	9,360		14,000		24,699		183,954	
2-Butanone	7,580		14,400		164,656		1,226,178	
2-Methylnaphthalene								
4,4'-DDD	2.67		23.8		2.67		23.8	
4,4'-DDE	1.88		16.8		1.88		16.8	
4,4'-DDT	1.88		16.8		1.88		16.8	
2-Methyl-2-pentanone								
Acenaphthene	13,400	g	44,300	g	16,466		122,640	
Acenaphthylene								
Acetone	3,820	g	4,160	g	27,433		204,400	
Anthracene	59,100	g	151,000	g	82,330		613,200	
Arochlor-1242	10	h	25	h	0.083		0.74	
Arochlor-1248	10	h	25	h	0.083		0.74	
Arochlor-1254	10	h	25	h	0.083		0.74	
Arochlor-1260	10	h	25	h	0.083		0.74	
delta-BHC								
gamma-BHC	82.3		613					0.4

Table A-6 Soil/Solid Media Contaminant-Specific ARARs RSR Corporation Superfund Site OU No.3								
Chemical	1 R&A Residential (mg/kg)	a,b,c	1 R&A Industrial (mg/kg)	a,c,d	2 TBC Residential (mg/kg)		2 TBC Industrial (mg/kg)	3 A (mg/L)
Benzene	1.33	g	1.62	g	22		197	0.5
Benzo(a)anthracene					0.87		7.84	
Benzo(a)pyrene					0.087		0.784	
Benzo(b)fluoranthene					0.87		7.84	
Benzo(g,h,i)perylene								
Benzo(k)fluoranthene					8.77		78.4	
bis(2-Ethylhexyl)phthalate	45.7		409		45.7		409	
Carbazole					32		286	
alpha-Chlordane	0.493	i	4.4	i				0.03
gamma-Chlordane	0.493	i	4.4	i				
Chrysene					87.7		784	
Di-n-butyl phthalate	27,400		204,000		27,433		204,400	
Di-n-octyl phthalate	5,490		40,900		5,488		40,880	
Dibenz(a,h) anthracene					0.087		0.784	
Dibenzofuran					1,097		8,176	
Dieldrin	0.04		0.357		0.04		0.357	
Diethylphthalate	220,000		NHHB		219,548		1,635,200	
Endosulfan I	13.7	j	102	j	1,646		12,264	
Endosulfan II	13.7	j	102	j				
Endosulfan sulfate								
Endrin	82.3		613		82.3		613	0.02
Endrin aldehyde								
Endrin ketone								
Ethylbenzene	11,400	g	17,000	g	27,443		204,393	
Fluoranthene	11,000		81,800		10,977		81,760	
Fluorene	9,600	g	38,700	g	10,977		81,760	
Heptachlor epoxide	0.0704		0.629		0.0704		0.629	
Indeno(1,2,3-cd)pyrene					0.87		7.84	
Methylene chloride	10.7	g	13.8	g	85.3		763	
N-Nitrosodiphenylamine								
Naphthalene	491		772					
Phenanthrene								
Phenol	165,000		NHHB		164,661		1,226,400	
Pyrene	8,200		61,400		8,233		61,320	
Toluene	3,580	g	3,630	g	54,885		408,738	
Trichloroethene	2.4	g	2.85	g	58.2		520	

<b>Table A-6</b> <b>Soil/Solid Media Contaminant-Specific ARARs</b> <b>RSR Corporation Superfund Site OU No.3</b>								
Chemical	1 R&A Residential (mg/kg)	a,b,c	1 R&A Industrial (mg/kg)	a,c,d	2 TBC Residential (mg/kg)		2 TBC Industrial (mg/kg)	3 A (mg/L)
Xylene (total)	5,470	g	5,800	g	548,872		4,088,000	
Notes: Medium-Specific Concentrations, Standards, and Criteria for Health-Based Closure/Remediation 30TAC Section 335.568, Appendix II. Preliminary Remediation Goals. Calculated Based on Human Health Evaluation Manual, Part B; Development of Risk-Based Preliminary Remediation Goals. OSWER Directive 9285.7-01B. Toxicity Characteristic Leaching Procedure (TCLP) criteria. 40 CFR Part 261. Note, units are mg/L. a = Residential soil concentrations (maximum) are calculated according to 30 TAC Section 335.567. b = All concentrations calculated using data from IRIS and HEAST. c = In some cases, an oral RfD or an oral slope factor was substituted for the inhalation RfD or inhalation slope factor. d = Industrial soil concentrations (maximum) are calculated according to 30 TAC Section 335.567. e = Based on values calculated using EPA's Lead Uptake/Biokinetic Model, Version 0.4. f = The MSCs calculated for this compound are based on noncarcinogenic effects. g = The sum of concentrations of the volatile compounds in vapor phase in soil shall not exceed 1,000 ppm by weight or volume. h = Soil MSCs for polychlorinated biphenyls are based on the April 2, 1987 TSCA Regulations; 52 FR 10688. i = Value presented is for chlordane. j = Value presented is for endosulfan. k = Based on values calculated using EPA's Lead Uptake/Biokinetic Model, Version 0.99. l = Based on Bowers methodology. A = Applicable. R&A = Relevant and appropriate. TBC = To be considered.								

<p align="center"><b>Table A-7</b>  <b>Surface Water ARARs</b>  <b>RSR Corporation Superfund Site OU No. 3</b></p>			<b>Page 1 of 10</b>
<b>Requirement</b>	<b>ARAR?</b>	<b>Justification</b>	
<b>1. Contaminant-Specific ARARS</b>			
<b>Federal</b>			
Safe Drinking Water Act 40 U.S.C. 399 Primary Drinking Water Standards (MCL) 40 C.F.R. Part 141	No	There is no direct contact between the source of contaminants and surface water at the site. Surface waters around site are not designated for public or private water supply. MCLs are not ARARs for surface water at OU No. 3.	
Secondary Drinking Water Standards 40 C.F.R. Part 143	No	Secondary standards are aesthetic rather than health based and therefore are not ARARs as surface water is unlikely to be utilized as a source of drinking water.	
Maximum Contaminant Level Goals (MCLG) 40 C.F.R. § 141.50	No	Not presently considered an ARAR as surface waters are not utilized as a source of drinking water.	
Federal Clean Water Act Water Quality Criteria 40 C.F.R. Part 131 U.S. EPA Quality Criteria for Water, 1976, 1980, and 1986	No	These criteria (ambient water quality criteria) apply to water classified as a fisheries resource. Water bodies on OU No. 3 are not classified as such. Therefore, not an ARAR or TBC for OU No. 3.	
Toxic Pollutant Effluent Standards 40 C.F.R. Part 129	No	Standards are applicable to point source discharges to navigable waters from specified facilities that discharge aldrin/dieldrin, DDT, endrin, toxaphene, benzdine, PCB's. No point source discharges to navigable waters are associated with OU No. 3.	
Hazardous Substances 40 C.F.R. § 116.3 and 116.4	No	Establishes reporting requirements for certain discharges of reportable quantities of hazardous substances. Creates no substantive clean up requirement. Not an ARAR.	

<p align="center"><b>Table A-7</b>  <b>Surface Water ARARs</b>  <b>RSR Corporation Superfund Site OU No. 3</b></p>			Page 2 of 10
<b>Requirement</b>	<b>ARAR?</b>	<b>Justification</b>	
<b>1. Contaminant-Specific ARARS (Continued)</b>			
<b>State</b>			
Pollution Prohibition Texas Water Code § 26.121	Yes	Prohibits the discharge of wastes into or adjacent to any natural or artificial bodies of surface water, inland or coastal, which in itself or in conjunction with any other discharge or activity, causes or will cause pollution of the surface water. May be relevant and appropriate for OU No. 3 due to discharges to onsite drainages.	
Texas Surface Water Quality Standards Aesthetics 30 TAC § 307.4(b)(1)	Yes	General prohibition of concentrations in surface water of taste and odor producing substances which impart unpalatable flavor to food fish including shellfish, or otherwise interfere with the reasonable use of the water in the state. Relevant and appropriate for OU No. 3 due to discharges to onsite drainages.	
General Toxicity 30 TAC § 307.4(d)	Yes	Surface waters must not be toxic to man or to terrestrial or aquatic life. Relevant and appropriate for OU No. 3 due to discharges to onsite drainages.	
Antidegradation 30 TAC § 307.5	Yes	Requires maintenance and protection of existing uses (baseline November 28, 1975) when discharging wastewater. Relevant and appropriate for OU No. 3 due to discharges to onsite drainages.	
Acute Toxicity 30 TAC § 307.6(b)(1)	No	Surface water must not be acutely toxic to aquatic life (except in small zones of initial dilution at discharge points). This criteria applies to water classified as a fisheries resource. The intermittent drainages and ponds on OU No. 3 are not classified as such; therefore, not an ARAR for OU No. 3.	
Chronic Toxicity 30 TAC § 307.6(b)(2)	No	Surface water with designated for existing aquatic life uses shall not be chronically toxic to aquatic life (except in mixing zones and below critical low-flow conditions). No surface water bodies impacted by OU No. 3 have a designated or aquatic life use; therefore the requirement is not an ARAR.	
Human Toxicity 30 TAC § 307.6(b)(3)	No	Surface water must be maintained to preclude adverse toxic effects on human health resulting from contact recreation, consumption of aquatic organisms, or consumption of drinking water after reasonable treatment. This regulation is not an ARAR to the extent that it pertains to drinking water, as surface water in the area is not a potential source of drinking water.	

<p style="text-align: center;"><b>Table A-7</b>  <b>Surface Water ARARs</b>  <b>RSR Corporation Superfund Site OU No. 3</b></p> <p style="text-align: right;"><b>Page 3 of 10</b></p>		
<b>Requirement</b>	<b>ARAR?</b>	<b>Justification</b>
<b>1. Contaminant-Specific ARARS (Continued)</b>		
<b>State (Continued)</b>		
Numerical Criteria for Toxics 30 TAC § 307.6(c)	Yes	<p>Numerical criteria are established for certain toxic materials. These criteria are relevant and appropriate for OU No. 3.</p> <p>Notes: (1) These numerical criteria are based on ambient water quality criteria documents published by EPA. For some chemicals, EPA criteria have been recalculated (in accordance with procedures in the EPA guidance document entitled "Guideline for Deriving Site-Specific Water Quality Criteria") to eliminate the effects of toxicity data for aquatic organisms which are not known to occur in Texas. 31 TAC § 307.6(c)(2).</p> <p>(2) Numerical Acute Criteria apply to all surface water (except in small zones of initial dilution at discharge points). Numerical chronic criteria apply to surface water with designated or existing aquatic life uses (except inside mixing zones and below critical low-flow conditions).</p> <p>(3) Numerical Acute Criteria are applied as 24-hour averages. Numerical Chronic criteria are applied as seven-day averages.</p>
LC50 Toxicity Criteria 30 TAC § 307.6(c)(8)	Yes	<p>Concentrations of toxic materials for which no numerical criteria have been specified must not exceed values which are chronically toxic to representative, sensitive aquatic organisms, as determined from appropriate chronic toxicity data or calculated as 0.1 of the median lethal concentration (LC50) for nonpersistent toxics (i.e., readily degrades, half-life less than 96 hours), 0.05 of LC50 for nonbioaccumulative, persistent toxics, and 0.01 of the completion of remediation. Relevant and appropriate for OU No. 3 due to discharges to onsite drainages.</p>

<p align="center"><b>Table A-7</b>  <b>Surface Water ARARs</b>  <b>RSR Corporation Superfund Site OU No. 3</b></p>			Page 4 of 10
<b>Requirement</b>	<b>ARAR?</b>	<b>Justification</b>	
<b>1. Contaminant-Specific ARARS (Continued)</b>			
<b>State (Continued)</b>			
Site-Specific Uses and Criteria 30 TAC § 307.7(b)(5)	Yes	Basic uses such as navigation, agricultural water supply, and industrial water must be maintained and protected for all surface water in which these uses can be achieved. Relevant and appropriate for OU No. 3 due to discharges to onsite drainages.	
Oyster Waters 30 TAC § 307.7(b)(3)(B)(iii)	No	Oyster waters should be maintained so that concentrations of toxic materials do not cause edible species of clams, oysters, and mussels to exceed accepted guidelines for the protection of public health, including the U.S. Food and Drug Administration action levels for molluscan shellfish. These criteria are not ARARs since no discharges to oyster water occur.	
Standards of Chemical Quality 30 TAC § 290.103(1),(3)	No	Specifies the maximum contaminant levels for inorganic and organic compounds that apply to community and non-transient, non-community water systems. These values are not ARARs for OU No. 3.	
Secondary Constituent Levels 30 TAC § 290.113	No	These secondary constituent level limits, based on aesthetic and organoleptic considerations, are applicable to all public water systems. These levels are TBC for OU No. 3.	
Attainment of Risk Reduction Standard Number 1: Closure/Remediation to Background Subchapter S 30 TAC § 335.554	No	These provisions specify that, to meet Risk Reduction Standard No. 1, closure and/or remediation must meet background levels or practical quantitation limits if the practical quantitation limit exceeds background. The provisions would be relevant and appropriate if Risk Reduction Standard No. 1 were the preferred standard; however, it is unlikely that cleanup goals will be set at background levels.	
Attainment of Risk Reduction Standard Number 2: Closure/Remediation to Health-Based Standards and Criteria Subchapter S 30 TAC § 335.555	Yes	Subsection (d) specifies that the concentration of a contaminant in contaminated media of concern such as groundwater, surface water, air, or soil shall not exceed the cleanup levels as defined in § 335.556 (relating to Determination of Cleanup Levels for Risk Reduction Standard No. 3). If the practical quantitation limit and/or background concentration is greater than the cleanup level, the greater of the practical quantitation limit or background shall be used for determining compliance with the requirements of this section. These provisions are relevant and appropriate to development of contaminant-specific cleanup goals for OU No. 3.	

<p style="text-align: center;"><b>Table A-7</b>  <b>Surface Water ARARs</b>  <b>RSR Corporation Superfund Site OU No. 3</b></p> <p style="text-align: right;"><b>Page 5 of 10</b></p>		
<b>Requirement</b>	<b>ARAR?</b>	<b>Justification</b>
<b>1. Contaminant-Specific ARARS (Continued)</b>		
<b>State (Continued)</b>		
Determination of Cleanup Levels for Risk Reduction Standard Number 2 Subchapter S 30 TAC § 335.556	Yes	Specifies that for purposes of risk reduction, cleanup levels for individual contaminants are represented by Texas or federal promulgated health-based standards, or when these are not available or do not provide appropriate protection, then cleanup levels based on procedures specified for determining other numerical criteria (medium-specific concentration or MSC) are required to be developed. These provisions are relevant and appropriate to OU No. 3.
Medium-Specific Concentrations for Risk Reduction Standard Number 2 Subchapter S 30 TAC § 335.558	Yes	Subsections (b) through (d) of this section specify the methods for calculating medium-specific concentrations for ingestion of surface water and groundwater, and for ingestion along with inhalation of volatiles and particulates. These provisions are relevant and appropriate to setting contaminant-specific cleanup goals for OU No. 3, and are to be applied after evaluation of 30 TAC § 307 and primary drinking water MCLs.
Medium-Specific Requirements and Adjustments for Risk Reduction Standard Number 2 Subchapter S 30 TAC § 335.559	Yes	Subsections (b) through (d) specify requirements that can define or modify numeric cleanup levels such as media-specific concentrations or require non-health based criteria to be addressed. These provisions are relevant and appropriate to establishing cleanup goals for OU No. 3.
Surface Water Media-Specific Concentration, Risk Reduction Standard Number 2 30 TAC § 335.558	Yes	To be applied after evaluation of 30 TAC § 307 and primary drinking water MCLs. Relevant and appropriate for OU No. 3 due to discharges to onsite drainages.

<p align="center"><b>Table A-7</b>  <b>Surface Water ARARs</b>  <b>RSR Corporation Superfund Site OU No. 3</b></p> <p align="right"><b>Page 6 of 10</b></p>		
<b>Requirement</b>	<b>ARAR?</b>	<b>Justification</b>
<b>2. Action-Specific ARARs</b>		
<b>Federal</b>		
Federal Clean Water Act National Pollutant Discharge Elimination System, Section 402	No	A permit is not required for onsite CERCLA response actions. Provision establishes no substantive cleanup requirement.
Stormwater Regulations 40 C.F.R. Parts 122, 125	Yes	NPDES permits are addressed relative to stormwater discharges associated with industrial activity. These regulations require the development and implementation of a stormwater pollution prevention plan or a stormwater best management plan. Monitoring and reporting requirements for a variety of facilities are outlined. Runoff from construction activities is an ARAR depending on the nature of the remedial action selected. Relevant and appropriate if stormwater discharge occurs as a result of the remedial action.
Pretreatment Standards 40 C.F.R. § 403.5	Yes	Prohibits discharge to a POTW of pollutants that "pass-through" (exit the POTW in quantities or concentrations that violate the POTW's NPDES permit) or cause "interference" (inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal, thereby causing a violation of the POTW's NPDES permit). Also prohibits introduction into a POTW of: (1) pollutants which create a fire or explosion hazard, (2) pollutants which will cause corrosive structural damage, (3) solid or viscous pollutants that will obstruct flow, (4) pollutants discharged at a flow rate and/or concentration that will cause interference, and (5) heat that will inhibit biological activity (never over 104°C). No point source discharges have been documented. However, if a remedial action results in a point source discharge to a POTW, then the requirements will be applicable to OU No. 3.

<p style="text-align: center;"><b>Table A-7</b>  <b>Surface Water ARARs</b>  <b>RSR Corporation Superfund Site OU No. 3</b></p>			Page 7 of 10
Requirement	ARAR?	Justification	
<b>2. Action-Specific ARARs (Continued)</b>			
<b>State</b>			
Consolidated Permits Standard Permit Conditions 30 TAC § 305.125	No	Specifies conditions applicable to all permits. A permit is not required for onsite CERCLA response actions. The provisions establish no substantive cleanup requirements.	
Consolidated Permits Subchapter O, Additional Conditions and Procedures for Wastewater Discharge Permits and Sewage Sludge Permits	No	Adopts by reference 40 CFR Part 122, Subpart C, Permit Conditions and Part 124, Subpart D, Specific Procedures Applicable to NPDES Permits. A permit is not required for onsite CERCLA response actions. The provisions establish no substantive cleanup requirement.	
Texas Water Quality Act, TCA, Water Code, Title 2 – State Water Commission	Yes	Places reporting requirements on remedial activities which may cause an accidental spill and discharge into the state waters. Whenever an accidental discharge or spill occurs at or from any activity or facility which causes or may cause pollution, the individual operating, in charge of, or responsible for the activity or facility shall notify the TNRCC as soon as possible and not later than 24 hours after the occurrence.  Activities which are inherently or potentially capable of causing or resulting in the spillage or accidental discharge of waste or other substances and which pose serious or significant threats of pollution are subject to reasonable rules establishing safety and preventative measures which the commission may adopt or issue. The safety and preventative measures which may be required shall be commensurate with the potential harm which could result from the escape of the waste or other substances. Applicable to OU No. 3. during remediation.	

<p align="center"><b>Table A-7</b>  <b>Surface Water ARARs</b>  <b>RSR Corporation Superfund Site OU No. 3</b></p>			Page 8 of 10
Requirement	ARAR?	Justification	
<b>2. Action-Specific ARARs (Continued)</b>			
<b>State</b>			
General Provisions 30 TAC § 335.4	Yes	<p>Regulates the collection, handling, storage, disposal, and processing of hazardous or deleterious materials in the vicinity of, or adjacent to, state waters. Remedial actions must be designed with adequate measures and controls to ensure that no person may cause, suffer, allow, or permit the collection, handling, storage, processing, or disposal of industrial solid waste or municipal hazardous waste in such a manner to cause:</p> <ul style="list-style-type: none"> <li>• The discharge or imminent threat of discharge of industrial solid waste or municipal hazardous waste into or adjacent to the waters in the state without obtaining specific authorization for such a discharge from the TNRCC.</li> <li>• The creation and maintenance of a nuisance; or</li> <li>• The endangerment of the public health and welfare.</li> </ul> <p>Relevant and appropriate to actions taken at OU No. 3.</p>	
Post-Closure Care and Deed Certification for Risk Reduction Standard Number 2 Subchapter S 30 TAC § 335.560	Yes	These provisions specify that, upon attainment of Risk Reduction Standard Number 2, a deed recordation be placed in the County using information contained in subsections (1) through (4). This requirement is relevant and appropriate to OU No. 3 inasmuch that provisions similar to Risk Reduction Standard Number 2 are applied.	
Attainment of Risk Reduction Standard Number 3: Closure/Remediation with Controls Subchapter S 30 TAC § 335.561	Yes	Under Risk Reduction Standard Number 3, a remedy must be permanent, or if that is not practicable, achieve the highest degree of long-term effectiveness possible; cost-effective; and achieve media cleanup requirements specified in 30 TAC § 335.563. These provisions are relevant and appropriate to OU No. 3.	
Remedy Evaluation Factors for Risk Reduction Standard Number 3 Subchapter S 30 TAC § 335.562	Yes	These provisions outline the evaluation criteria when evaluating the relative abilities and effectiveness of potential remedies to achieve the requirements for remedies described in 30 TAC § 335.564. The evaluation criteria are relevant and appropriate for screening technologies and alternatives as part of the FS for OU No. 3.	

<p style="text-align: center;"><b>Table A-7</b>  <b>Surface Water ARARs</b>  <b>RSR Corporation Superfund Site OU No. 3</b></p>			Page 9 of 10
Requirement	ARAR?	Justification	
<b>2. Action-Specific ARARs (Continued)</b>			
<b>State</b>			
Media Cleanup Requirements for Risk Reduction Standard Number 3 Subchapter S 30 TAC § 335.563	Yes	This section specifies the requirements for establishing cleanup levels for air, surface water, groundwater, and soil, including use of media-specific adjustments. The requirements of this section are relevant and appropriate to OU No. 3.	
Post-Closure Care Not Required for Risk Reduction Standard Number 3 Subchapter S 30 TAC § 335.564	Yes	Where it is determined that neither engineering nor institutional control measures are required, no post-closure care responsibilities are necessary; however, deed recordation is required in accordance with 30 TAC § 335.566. This requirement is relevant and appropriate if the conditions are met at OU No. 3.	
<b>3. Location-Specific ARARS</b>			
<b>Federal</b>			
Fish and Wildlife Coordination Act 16 U.S.C. § 661 <u>et seq.</u> 16 U.S.C. § 742 a 16 U.S.C. § 2901	Yes	Requires consultation when a modification of a stream or other water body is proposed or authorized and requires adequate provision for protection of fish and wildlife resources. Relevant and appropriate for OU No. 3 due to onsite drainages.	
Marine Protection, Research and Sanctuaries Act 33 U.S.C. § 1401 (Title I) 40 C.F.R. Part 220 16 U.S.C. § 1431 <u>et seq.</u> (Title III) 15 C.F.R. Parts 922-941	No	Title I requires permit for dumping of wastes in U.S. ocean waters which have been transported from U.S. or from outside U.S. Activities at site will not include dumping of wastes into the ocean; therefore, title I is not an ARAR. Title III requires conservation and management of areas designated as National Marine Sanctuaries. Since there is no National Marine Sanctuary in or near the site, Title III is not an ARAR.	
Clean Water Act § 404 33 U.S.C. § 1344 40 C.F.R. Parts 230, 231	No	Requires permit for the discharge of dredge or fill material into waters of the United States including wetlands ( <u>see</u> 33 C.F.R. § 328.3). Not an ARAR since no discharge of dredge or fill material into waters of the U.S. is anticipated.	

<p align="center"><b>Table A-7</b>  <b>Surface Water ARARs</b>  <b>RSR Corporation Superfund Site OU No. 3</b></p>			Page 10 of 10
<b>Requirement</b>	<b>ARAR?</b>	<b>Justification</b>	
<b>3. Location-Specific ARARS (Continued)</b>			
<b>Federal (Continued)</b>			
Rivers and Harbors Act of 1899 33 U.S.C. § 403 33 C.F.R. Parts 320-322	No	Prohibits the creation of any unauthorized obstruction or work in navigable waters that affects such navigable waters without a permit. Even if navigable waters were present at the site, a nationwide permit is available for CERCLA site activities [see 33 C.F.R. § 330.5(a)(20)]. Since there are no navigable waters at the RSR Site, this requirement is not an ARAR.	
Protection of Wetlands Executive Order No. 11990 40 C.F.R. § 6.302(a) and Appendix A	Yes	Requires federal agencies to avoid, to the extent possible, the adverse impacts associated with the destruction or loss of wetlands and to avoid support of new construction in wetlands if a practical alternative exists.	
Floodplain Management Executive Order No. 11988 40 C.F.R. § 6.302(b)	Yes	Requires federal agencies to evaluate the potential effects of actions taken in a floodplain and to avoid or minimize impacts associated with direct and indirect development of a floodplain. Since portions of the site are within a 100-year floodplain, this Order is applicable, depending on location.	
Wild and Scenic Rivers Act 16 U.S.C. § 1271 <u>et seq.</u> 40 C.F.R. § 6.302(e)	No	Prohibits adverse effects on a scenic river. Since the site does not affect a scenic river, this Act is not an ARAR.	
Coastal Zone Management Act 16 U.S.C. § 1451 <u>et seq.</u> 40 C.F.R. § 6.302(d)	No	Requires assessment of the impacts of activities on a coastal zone and the conducting of activities in connection with a coastal zone in accordance with a state approved Coastal Zone Management Plan. The Act is not applicable or relevant and appropriate as OU No. 3 has no impact on coastal areas.	

<p align="center"><b>Table A-8</b>  <b>Surface Water Contaminant-Specific ARARs</b>  <b>RSR Corporation Superfund Site OU No. 3</b></p>											
Chemical	1 R&A (mg/L)		2 R&A (mg/L)		3 R&A (mg/L)		4 R&A (mg/L)		9 R&A (mg/L)		10 R&A (mg/L)
<b>Inorganics</b>											
Antimony									0.006		
Arsenic	0.05	a			0.36		0.19		0.05		
Barium	1.	a							2		
Beryllium									0.004		
Cadmium	0.01	a			32.2*	a	1.1**		0.005		
Chromium	0.05	a			1,679.4*	a	200.2**		0.1		
Cobalt											
Copper					18.5*	a	12.4**				
Lead	0.005	a	0.025		77.5*	a	3.0**				
Manganese											0.05
Mercury	0.0000122	b	0.0000122		0.0024	a	0.0013		0.002		
Nickel					1,370.1*	a	152.3**		0.1		
Selenium	0.01	a			0.02		0.005		0.05		
Silver	0.05	a			0.00092	a	0.00049				
Thallium									0.002		
Vanadium											
Zinc					113.0*	a	102.4**				5
<b>Organics</b>											
1,1,1-Trichloroethane	0.2								0.2		
2-Butanone											
2-Methylnaphthalene											
4,4'-DDD	0.000297		0.000299								
4,4'-DDE	0.0000544		0.0000545								
4,4'-DDT	0.0000527		0.0000528		0.0011		0.000001				
2-Methyl-4-pentanone											
Acenaphthene											
Acenaphthylene											
Acetone											
Anthracene											
Arochlor-1242	0.0000013		0.0000013		0.002		0.000014		0.0005		
Arochlor-1248	0.0000013		0.0000013		0.002		0.000014		0.0005		
Arochlor-1254	0.0000013		0.0000013		0.002		0.000014		0.0005		
Arochlor-1260	0.0000013		0.0000013		0.002		0.000014		0.0005		
delta-BHC											

Table A-8 Surface Water Contaminant-Specific ARARs RSR Corporation Superfund Site OU No. 3										
Chemical	1 R&A (mg/L)		2 R&A (mg/L)		3 R&A (mg/L)		4 R&A (mg/L)		9 R&A (mg/L)	10 R&A (mg/L)
gamma-BHC	0.004		0.016						0.0002	
Benzene	0.005		0.312						0.005	
Benzo(a)anthracene										
Benzo(a)pyrene									0.0002	
Benzo(b)fluoranthene										
Benzo(g,h,i)perylene										
Benzo(k)fluoranthene										
bis(2-ethylhexyl)phthalate										
Carbazole										
alpha-Chlordane	0.000021	b, c	0.0000213		0.0024	c	0.0000043	c	0.002	c
gamma-Chlordane	0.000021	b, c	0.0000213		0.0024	c	0.0000043	c	0.002	c
Chrysene										
Di-n-butyl phthalate										
Di-n-octyl phthalate										
Dibenz(a,h) anthracene										
Dibenzofuran										
Dieldrin	0.0000012	d	0.0000012		0.0025		0.0000019			
Diethylphthalate										
Endosulfan I					0.00022	d	0.000056	d		
Endosulfan II					0.00022	d	0.000056	d		
Endosulfan sulfate										
Endrin	0.0002				0.00018		0.0000023		0.002	
Endrin aldehyde										
Endrin ketone										
Ethylbenzene									0.7	
Fluoranthene										
Fluorene										
Heptachlor epoxide	0.00108		0.00739						0.0002	
Indeno(1,2,3-cd)pyrene										
Methylene chloride									0.005	
N-Nitrosodiphenylamine										
Naphthalene										
Phenanthrene					0.03		0.03			
Phenol										
Pyrene										

Table A-8 Surface Water Contaminant-Specific ARARs RSR Corporation Superfund Site OU No. 3											
Chemical	1 R&A (mg/L)		2 R&A (mg/L)		3 R&A (mg/L)		4 R&A (mg/L)		9 R&A (mg/L)		10 R&A (mg/L)
Toluene									1		
Trichloroethene	0.005								0.005		
Xylene (total)									10		
Notes: <sup>1</sup> Criteria in Water for Specific Toxic Materials--Human Health Protection. Category A--Water and Fish. 30 TAC Section 307.6 Toxic Materials <sup>2</sup> Criteria in Water for Specific Toxic Materials--Human Health Protection. Category B--Fresh Water Fish Only. 30 TAC Section 307.6 Toxic Materials <sup>3</sup> Criteria in Water for Specific Toxic Materials--Aquatic Life Protection. Fresh Acute Criteria. 30 TAC Section 307.6 Toxic Materials <sup>4</sup> Criteria in Water for Specific Toxic Materials--Aquatic Life Protection. Fresh Chronic Criteria. 30 TAC Section 307.6 <sup>9</sup> Standards of Chemical Quality, 30 TAC Section 290.103 (Note: Texas Maximum Contaminant Levels) <sup>10</sup> Secondary Constituent Levels, 30 TAC Section 290.113 (Note: Texas Secondary Maximum Contaminant Levels TBC = To be considered. R&A = relevant and appropriate.  a = Indicates that the criteria for a specific parameter are for the dissolved portion in water. All other criteria are for total recoverable concentrations. b = Calculations are based on USFDA Action Levels for fish tissue concentrations. c = Value is for chlordane d = Calculations are based on measured bioconcentration factors, and no lipid content correction factor was applied. e = Value is for hexavalent chromium.  * Hardness depended criteria based on the following: Cadmium $e^{(1.128[\ln(\text{hardness})]-1.6774)}$ Chromium $e^{(0.8190[\ln(\text{hardness})]+3.688)}$ Copper $e^{(0.9422[\ln(\text{hardness})]-1.3844)}$ Lead $e^{(1.273[\ln(\text{hardness})]-1.460)}$ Nickel $e^{(0.8460[\ln(\text{hardness})]+3.3612)}$ Zinc $e^{(0.8473[\ln(\text{hardness})]+0.8604)}$  ** Hardness dependent criteria based on the following: Cadmium $e^{0.7852[\ln(\text{hardness})]-3.490}$ Chromium $e^{0.8190[\ln(\text{hardness})]+1.561}$ Copper $e^{0.8545[\ln(\text{hardness})]-1.386}$ Lead $e^{1.273[\ln(\text{hardness})]-4.705}$ Nickel $e^{(0.8460[\ln(\text{hardness})]+1.1645)}$ Zinc $e^{(0.8473[\ln(\text{hardness})]+0.7614)}$  Assumes hardness = 96 mg/L as CaCO3. Table 2--Basin pH and Total Hardness Values to be Used for Evaluation of Selected Toxic Parameters. 30 TAC Section 307.6 Toxic Materials											

<p align="center"><b>Table A-9</b>  <b>Air ARARs</b>  <b>RSR Corporation Superfund Site OU No. 3</b></p>			Page 1 of 6
Requirement	ARAR?	Justification	
<b>1. Contaminant-Specific</b>			
<b>Federal</b>			
National (Primary and Secondary) Ambient Air Quality Standards (NAAQS) 40 C.F.R. Part 50	Yes	The NAAQS specify the maximum concentration of a federally regulated air pollutant (i.e., SO <sub>2</sub> , particulate matter (PM <sub>10</sub> ), NO <sub>2</sub> , CO, ozone, and lead) in an area resulting from all sources of that pollutant. No new construction or modification of a facility, structure or installation may emit an amount of any criteria pollutant that will interfere with the attainment or maintenance of a NAAQS (see 40 C.F.R. § 51.160). For the federal NAAQS standards, all measurements of air quality are corrected to a reference temperature of 25°C and to a reference pressure of 760mm Hg (1,013.2 millibars). 40 C.F.R. § 50.3.	
National Emission Standards for Hazardous Air Pollutants (NESHAPs) 40 C.F.R. Part 61 Subpart A	No	These provisions regulate the emissions of specified "hazardous air pollutants" [listed in 40 C.F.R. § 61.01(a)] that are emitted from particular <u>sources</u> or <u>processes</u> [listed in 40 C.F.R. Part 61].	
Fugitive Emissions Source Standards 40 C.F.R. Part 61 Subpart V	No	Regulates specified equipment which are potential sources of fugitive emissions because they contain or contact fluid which is at least 10% by weight a volatile hazardous air pollutant ("VHAP"—including benzene and vinyl chloride). This requirement is not an ARAR as no fluid containing at least 10% by weight of a VHAP is present at the site.	
Mercury Standards 40 C.F.R. Part 61 Subpart E	No	These provisions apply to stationary sources that process mercury ore, and incinerate or dry wastewater treatment plant sludge. The requirement is not an ARAR as no processing of mercury ore and/or no incineration of wastewater treatment plant sludge will occur at the site.	
<b>State</b>			
Particulates—Net Ground Level 30 TAC § 111.155	Yes	Establishes the net ground level concentration (downwind at the property boundary minus upwind measurements) of particulate emissions from any source that must not be exceeded.	
SO <sub>2</sub> Ground Level Concentration 30 TAC § 112.7	No	SO <sub>2</sub> emissions from any source must not exceed a net ground level concentration (downwind at property boundary minus upwind). Not in ARAR since no SO <sub>2</sub> emissions are expected during or after remediation.	
Hydrogen Sulfide 30 TAC § 112.31 & § 112.32	No	Sets net ground level concentration limits for hydrogen sulfide. Not an ARAR since no hydrogen sulfide emissions are expected during or after remediation.	

<p align="center"><b>Table A-9</b>  <b>Air ARARs</b>  <b>RSR Corporation Superfund Site OU No. 3</b></p>			Page 2 of 6
<b>Requirement</b>	<b>ARAR?</b>	<b>Justification</b>	
Sulfuric Acid 30 TAC § 112.41	No	Sets net ground level concentration limits for sulfuric acid. Not an ARAR since no sulfuric acid emissions are expected during or after remediation.	
Inorganic Fluoride 30 TAC § 113.3(a)(2) and (a)(3)	No	Sets atmospheric and net ground level concentration limits for inorganic fluoride (as HF). Not an ARAR since no HF emissions are expected during or after remediation.	
Beryllium 30 TAC § 113.3(b)	No	Sets atmospheric and net ground level concentration limits for beryllium. It is not expected that beryllium emissions will be generated during or after remediation.	
Lead Emissions from smelting facilities	No	Rules relate to lead emissions from stationary sources in Dallas County. Sets standards for the control of lead emissions in Dallas County. Not an ARAR because smelter emissions as a result of an operating facility do not exist.	
Attainment of Risk Reduction Standard Number 1: Closure/Remediation to Background Subchapter S 30 TAC § 335.554	No	These provisions specify that, to meet Risk Reduction Standard Number 1, closure and/or remediation must meet background levels or practical quantitation limits if the practical quantitation limit exceeds background. These provisions would be relevant and appropriate if Risk Reduction Standard Number 1 were the preferred standard; however, it is unlikely that cleanup goals will be set at background levels.	
Attainment of Risk Reduction Standard Number 2: Closure/Remediation to Health-Based Standards and Criteria Subchapter S 30 TAC § 335.555	Yes	Subsection (d) specifies that the concentration of a contaminant in contaminated media of concern such as groundwater, surface water, air or soil shall not exceed the cleanup levels as defined in § 335.556 (relating to Determination of Cleanup Levels for Risk Reduction Standard Number 3). If the practical quantitation limit and/or background concentration is greater than the cleanup level, the greater of the practical quantitation limit or background shall be used for determining compliance with the requirements of this section. These provisions are relevant and appropriate to development of contaminant-specific cleanup goals for OU No. 3.	
Determination of Cleanup Levels for Risk Reduction Standard Number 2 Subchapter S 30 TAC § 335.556	Yes	Specifies that for purposes of risk reduction, cleanup levels for individual contaminants are represented by Texas or federal promulgated health-based standards, or when these are not available or do not provide appropriate protection, then cleanup levels based on procedures specified for determining other numeric criteria (medium-specific concentration or MSC) are required to be developed. These provisions are relevant and appropriate to OU No. 3.	

<p style="text-align: center;"><b>Table A-9</b>  <b>Air ARARs</b>  <b>RSR Corporation Superfund Site OU No. 3</b></p> <p style="text-align: right;"><b>Page 3 of 6</b></p>		
<b>Requirement</b>	<b>ARAR?</b>	<b>Justification</b>
Criteria for Selection of Non-residential Soil Requirements for Risk Reduction Standard Number 2 Subchapter S 30 TAC § 335.557	Yes	Specifies the conditions under which soil requirements can deviate from residential soil requirements. Subsection (1) notes that for property located within the jurisdictional area of a zoning authority, documentation may be provided to demonstrate that the property is zoned for commercial or industrial use. These provisions are relevant and appropriate as they pertain to particulates generated from contaminated soil.
Medium Specific Concentrations for Risk Reduction Standard Number 2 Subchapter S 30 TAC § 335.558	Yes	Subsections (b) through (d) of this section specify the methods for calculating medium specific concentrations for ingestion of surface water and groundwater, and soil ingestion along with inhalation of volatiles and particulates. These provisions are relevant and appropriate to setting contaminant-specific cleanup goals for OU No. 3, and are to be applied after evaluation of the National Ambient Air Quality Standards and NESHAPs, and other applicable federal standards. Texas Air Control Board standards also apply according to these provisions.
Medium Specific Requirements and Adjustments for Risk Reduction Standard Number 2 Subchapter S 30 TAC § 335.559	Yes	Subsections (b) through (h) specify requirements that can define or modify numeric cleanup levels such as media-specific concentrations or require non-health based criteria to be addressed. These provisions are relevant and appropriate to establishing cleanup goals for OU No. 3.

<p align="center"><b>Table A-9</b>  <b>Air ARARs</b>  <b>RSR Corporation Superfund Site OU No. 3</b></p>			Page 4 of 6
<b>Requirement</b>	<b>ARAR?</b>	<b>Justification</b>	
<b>2. Action-Specific</b>			
<b>Federal</b>			
Prevention of Significant Deterioration of Air Quality 42 U.S.C. § 7475 40 C.F.R. § 52.21	No	These provisions impose various requirements (e.g. use of best available control technology) on any new major stationary source of a federally regulated air pollutant in an area which has been designated attainment or unclassifiable for that pollutant. A "major stationary source" is a source listed in 40 C.F.R. § 52.21 which emits, or has the potential to emit, 100 tons per year of a federally regulated air pollutant or any non-listed source that emits, or has the potential to emit, 250 tons per year of a federally regulated air pollutant. Activities at OU No. 3 are not expected to constitute a major stationary source of any federally regulated air pollutant. The requirement is not an ARAR.	
Nonattainment Areas – LAER 42 U.S.C. § 172(b)(6) and § 173	No	A state's permit program under the federal Clean Air Act must require permits for the construction and operation of new major stationary sources in NAAQS nonattainment areas. Such a permit may be issued only if the proposed source complies with "lowest achievable emission rate" requirements. Not an ARAR since activities at OU No. 3 do not constitute new major stationary sources.	
New Source Performance Standard for Incinerators 40 C.F.R. Part 60 Subpart E	No	Sets a limit for particulate emissions of 0.18g/dscm (0.08 gr/dscf) corrected to 12% CO <sub>2</sub> . Not an ARAR since the rule applies to furnaces burning municipal waste.	
Hazardous Waste Incinerators 40 C.F.R. Part 264, Subpart O	No	Not an ARAR since a hazardous waste incinerator is unlikely to be used at OU No. 3.	
<b>State</b>			
Control of Air Pollution by Permits for New Construction or Modification 30 TAC § 116	Yes	New non-exempt facilities which may emit air pollutants must obtain a construction permit or special permit. To obtain such a permit, the owner or operator of the proposed facility must provide for measuring emissions of significant air contaminants, and must demonstrate, among other things, that the facility will utilize the "best available control technology, with consideration given to the technical practicability and economic reasonableness of reducing or eliminating the emissions from the facility." Applies during construction activities. May be relevant and appropriate.	

<p style="text-align: center;"><b>Table A-9</b> <b>Air ARARs</b> <b>RSR Corporation Superfund Site OU No. 3</b></p> <p style="text-align: right;"><b>Page 5 of 6</b></p>		
<b>Requirement</b>	<b>ARAR?</b>	<b>Justification</b>
Requirements for Specified Sources 30 TAC § 111.111	Yes	Visible emissions shall not be permitted to exceed an opacity of 30% for any six-minute period from any building, enclosed facility, or other structure. Applies during any activity that may generate visible emissions. Relevant and appropriate for construction activities at OU No. 3.
Storage of Lead Containing Materials 30 TAC § 113.82(a) and (b)	Yes	No unenclosed storage of material containing more than 1% lead by weight. All particulate matter containing more than 1% lead by weight collected by air pollution control equipment shall be stored in closed containers or in a structure under significant negative pressure to prevent emissions to the atmosphere. Applies if lead content exceeds 1% by weight. Applicable to OU No. 3.
Transport of Materials 30 TAC § 113.84(1) and (2)	Yes	All transport vehicles carrying materials containing more than 1% lead by weight must have covered cargo compartments at all times on plant property except during loading and unloading, when being washed, or inside a building. Each time a vehicle leaves a structure, all material containing more than 1% lead by weight shall be removed from the wheels; if water is used, this requirement is suspended during freezing weather. Applies if lead content exceeds 1% by weight. Applicable to OU No. 3.
Control of Fugitive Dust 30 TAC § 113.91(a), (b), (c)	Yes	All plant roads shall be paved; parking areas and storage areas for materials containing more than 1% lead by weight shall be paved. Open unpaved areas must be vegetated or covered with rock or crushed aggregate at least three inches deep. Applies if lead content exceeds 1% by weight. Applicable to OU No. 3.
Additional Measures to Reduce Lead Emissions 30 TAC § 113.92(1)	Yes	If they occur outside buildings, spills of dust containing more than 1% lead by weight shall be dampened and cleaned up immediately. Applies if lead content exceeds 1% by weight. Applicable to OU No. 3.
Post Closure Care and Deed Certification for Risk Reduction Standard Number 2 Subchapter S 30 TAC § 335.560	Yes	These provisions specify that, upon attainment of Risk Reduction Standard Number 2, a deed recordation be placed in the county using information contained in Subsections (1) through (4). This requirement is relevant and appropriate to OU No. 3 in so much that provisions similar to Risk Reduction Standard Number 2 are applied.

<p align="center"><b>Table A-9</b> <b>Air ARARs</b> <b>RSR Corporation Superfund Site OU No. 3</b></p>			Page 6 of 6
<b>Requirement</b>	<b>ARAR?</b>	<b>Justification</b>	
Attainment of Risk Reduction Standard Number 3: Closure/Remediation with Controls Subchapter S 30 TAC § 335.561	Yes	Under Risk Reduction Standard Number 3, a remedy must be permanent, or if that is not practicable, achieve the highest degree of long-term effectiveness possible; cost-effective; and achieve media cleanup requirements specified in 30 TAC § 335.563. These provisions are relevant and appropriate to OU No. 3.	
Remedy Evaluation Factor for Risk Reduction Standard Number 3 Subchapter S 30 TAC § 335.562	Yes	These provisions outline the evaluation criteria when evaluating the relative abilities and effectiveness of potential remedies to achieve the requirements for remedies described in 30 TAC § 335.561. The evaluation criteria are relevant and appropriate for screening technologies and alternatives as part of the FS for OU No. 3.	
Media Cleanup Requirements for Risk Reduction Standard Number 3 Subchapter S 30 TAC § 335.563	Yes	This section specifies the requirements for establishing cleanup levels for air, surface water, groundwater, and soil, including use of media – specific adjustments. The requirements of this section are relevant and appropriate to OU No. 3.	
Post Closure Care Not Required for Risk Reduction Standard Number 3 Subchapter S 30 TAC § 335.564	Yes	Where it is determined that neither engineering nor institutional control measures are required, no post closure care responsibilities are necessary; however, deed recordation is required in accordance with 30 TAC § 335.566. This requirement is relevant and appropriate if the conditions are met at OU No. 3.	
<b>2. Location-Specific</b>			
<b>State</b>			
General Application; Proximity of New Construction to Schools 30 TAC § 116.111	Yes	Requires the Texas Air Control Board to consider, in issuing a permit for construction of a facility, any adverse short-term or long-term side effects that an air contaminant or nuisance odor from the facility may have on the individuals attending an elementary, junior high, or senior high school within 3,000 feet of the facility. Since a school is located within 3,000 feet of Site No. 4 of OU No. 3, the requirements is relevant and appropriate.	

<p style="text-align: center;"><b>Table A-11</b>  <b>Miscellaneous Location-Specific ARARs</b>  <b>RSR Corporation Superfund Site OU No. 3</b></p> <p style="text-align: right;"><b>Page 1 of 2</b></p>		
<b>Requirement</b>	<b>ARAR??</b>	<b>Justification</b>
<b>I. Location-Specific</b>		
<b>Federal</b>		
National Historic Preservation Act 16 U.S.C. § 470 40 C.F.R. § 6.301(b) 36 C.F.R. Part 800	No	Requires federal agencies to take into account the effect of any federally-assisted undertaking or licensing on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historical Places. There is no such district, site, building, structure, or object in or near the RSR site; therefore, the Act is not an ARAR.
Archeological and Historic Preservation Act 16 U.S.C. § 469 40 C.F.R. § 6.301(c)	Yes	Establishes procedures to provide for preservation of scientific, historical, and archeological data which might be destroyed through alteration of terrain as a result of a federal construction project or a federally licensed activity or program. If scientific, historical, or archaeological artifacts are discovered at the site, work in the area of the site affected by such discovery will be halted pending the completion of any data recovery and preservation activities required pursuant to the Act and its implementing regulations.
Historic Sites, Buildings, and Antiquities Act 15 U.S.C. § 461 <u>et seq.</u> 40 C.F.R. § 6.301(a)	No	Requires federal agencies to consider the existence and location of landmarks on the National Registry of Natural Landmarks to avoid undesirable impacts on such landmarks. There is no such landmark that will be affected by the proposed remedy; therefore, the Act is not an ARAR.
Endangered Species Act 16 U.S.C. § 1531 <u>et seq.</u> 50 C.F.R. Part 402	No	Requires that proposed action minimize impacts on endangered species within critical habitats upon which endangered species depend, including consultation with Department of Interior. No plant or animal endangered species of "critical habitat" will be impacted by the proposed remedy at the site; therefore, the Act is not an ARAR.
Wilderness Act 16 U.S.C. § 1131 <u>et seq.</u> 50 C.F.R. Part 35	No	Requires the administration of federally owned wilderness areas to leave them unimpacted. There is no federally owned wilderness area that will be impacted by the proposed remedy; therefore, the Act is not an ARAR.

<p style="text-align: center;"><b>Table A-11</b>  <b>Miscellaneous Location-Specific ARARs</b>  <b>RSR Corporation Superfund Site OU No. 3</b></p> <p style="text-align: right;"><b>Page 2 of 2</b></p>		
<b>Requirement</b>	<b>ARAR??</b>	<b>Justification</b>
<b>Federal (Continued)</b>		
National Wildlife Refuge System 16 U.S.C. §§ 668dd, 668ee 50 C.F.R. Part 27	No	Restricts activities within a National Wildlife Refuge. The proposed remedy will not affect a National Wildlife Refuge; therefore, these provisions are not ARARs.
<b>State</b>		
Antiquities Code of Texas TEX. NAT. RES. COD. ANN., CH. 191	No	Prohibits the taking, altering, damaging, destroying, or excavating of a state archeological landmark without a contract or permit. Unless a state archeological landmark is present at the site, the Code is not an ARAR.